PETITIONER'S EXHIBIT ECB
I.U.R.C. CAUSE NO. 39938

INDIANAPOLIS POWER & LIGHT COMPANY
1994 ELECTRIC RATE CASE

EDWARD C. BODMER

DIRECT TESTIMONY
ON
FAIR VALUATION OF PROPERTY

SPONSORING
PETITIONER'S EXHIBITS ECB-1 THROUGH ECB-9

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EDWARD C. BODMER, TESTIMONY
INDIANAPOLIS POWER & LIGHT COMPANY
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Mr. Bodmer's testimony considers how the fair value of IPL's property should incorporate the superior productivity of its assets. He assesses IPL's relative productivity from the perspective of alternative valuation methodologies used by IPL witness Larry Loos and in the context of economic and regulatory principles which must provide the basis for valuing IPL's property. Mr. Bodmer's testimony includes an analysis of how much tangible value IPL has created by performing better than other companies in the electric utility industry. His approach compares IPL to other U.S. electric utilities on the basis of cost-to-serve adjusted for inherent cost differences related to service territory, customer characteristics and other factors that cannot be directly influenced by management. Mr. Bodmer concludes that:

1) The fair value of IPL's property should be computed by simulating valuation techniques which measure asset values in efficient competitive markets and therefore must include consideration of relative performance;

2) IPL's performance in managing distribution, transmission, generation and other assets has been exemplary as compared to other investor-owned electric utility companies, and IPL's production costs are much lower than the average price of power from non-utility generating companies;

3) Over the last twelve years, the value customers have received from IPL's performance relative to other companies in the electric utility industry has been $1.7 billion;

4) Consideration of tangible asset value created from IPL's relative productivity is equitable, efficient and consistent with regulation designed to replicate a competitive marketplace; and,

5) Trended original cost understates the value of IPL's assets by $992 million while replacement cost and reproduction cost at current prices understate the value of IPL's assets to a far lesser degree.

Petitioner's Exhibit ECB
I.U.R.C. Cause No. 39938

DIRECT TESTIMONY OF EDWARD C. BODMER

TABLE OF CONTENTS

DIRECT TESTIMONY OF EDWARD C. BODMER

I. QUALIFICATIONS

Q1. Please state your name, business address and occupation.

(a) My name is Edward C. Bodmer, my business address is 205 North Michigan Avenue, Suite 4315, Chicago, Illinois 60601. I am an economic and financial consultant specializing in matters related to the electric utility industry.

Q2. On whose behalf are you testifying and what is the subject of your testimony?

(a) I am testifying for Indianapolis Power & Light Company ("IPL") on the fair value of IPL's property and quantification of the tangible value which IPL has created through its management performance. This testimony has been prepared by me or under my direction.

Q3. Summarize your educational background and business and professional experience.

(a) I received a B.S. degree in Finance (with highest honors) from the University of Illinois in 1979 and an MBA degree (with honors) from the University of Chicago in 1986. My regulatory experience began with my employment on the Accounting and Finance Staff of the Illinois Commerce Commission and has encompassed numerous assignments on regulatory subjects as a consultant. In a past position as a Vice President at the First National Bank of Chicago, I managed credit analysis of all energy loans which included transactions for electric and gas utility companies. I also directed a number of energy related financial advisory projects for bank clients. In my current practice I have completed assignments for financial institutions, utility companies, and government agencies involving industry re-structuring, forecasting, pricing, resource planning and performance evaluation. I have testified on a wide variety of subjects including regional cost-of-service, management efficiency, asset spin-offs, construction programs, optimal capital structure, rate design, and credit quality.

Q4. Do you have experience related to the valuation of management performance for electric utility companies?

(a) Yes. Over the course of my career I have directed a number of projects related to valuation of electric utility assets and quantification of management performance. For example, I have valued electric utility

transmission, distribution and generation assets as part of the review of options associated with expiration of a major municipal franchise; I have quantified the management performance of individual electricity distribution companies in New Zealand; I have testified on differences in value and cost to serve between various regional areas of an electric utility; I have developed valuations for utility companies in the course of financial advisory work; I have testified on financial matters in a dispute related to valuation of co-generation assets; and, for the past five years, I have developed a comprehensive database and detailed statistical models to evaluate the management performance of U.S. electric utility companies.

In addition to these projects, I have reviewed literature on valuation of assets and measurement of performance and I have created computer models which simulate the value of financial securities. My educational and professional background has included course work in many aspects of valuing assets and financial securities. I have authored a number of articles on performance measurement, regulatory policy and utility financial analysis.

Q5. What sources of information and data did you use in conducting your research for this testimony?

(a) My research which has supported this testimony is derived from primarily four different information sources. First, I have compared IPL's cost-to-serve with other utility companies using a data base of 125 investor-owned utility companies which includes accounting, operational and regional data over the period from 1982 to 1993.[1] Second, I have reviewed information on the valuation of utility assets based on economic theory, the Indiana Public Utility Statute, and other rate cases in Indiana. Third, I have personally researched IPL's management practices through interviewing IPL staff, examining IPL facilities, and discussing my valuation methodologies with other IPL witnesses. Fourth, I have used my experience in evaluating electric utility cost structures to develop statistical models which measure the productivity of IPL's assets relative to other utility companies in the industry.

II. OVERVIEW OF TESTIMONY

Q6. What is the purpose and scope of your testimony?

(a) I have been asked by IPL to review how measurement of the fair value of its property should incorporate the productivity of a its assets as

[1] I have used other comparison bases as well as the 125 investor owned utility companies where other bases of comparison were relevant. For example in comparing coal costs I focused on Illinois basin coal.

compared with the productivity of assets deployed by other companies in the electric utility industry. My assignment included consideration of relative productivity in the context of alternative valuation methodologies used by IPL witness Larry Loos to measure the fair value of IPL's property. In analyzing these issues I summarize economic and regulatory principles which provide the basis for valuing IPL's property and I evaluate how valuation should incorporate measurement of tangible value created from IPL's performance relative to other electric utility companies. I also contrast alternative methods for computing fair value rate base based on economic, financial and regulatory theory.

I have prepared an analysis which quantifies how much tangible value IPL has created (or lost) by performing better (or worse) than other companies in the electric utility industry in order to provide information in evaluating fair valuation of its property. In this analysis I compute how much value IPL's shareholders would have derived from IPL's management performance if the company had operated in an unregulated market. My approach compares IPL to other U.S. electric utilities companies on the basis of cost-to-serve adjusted for inherent cost differences related to service territory, customer characteristics and other factors that cannot be directly influenced by management.

The four principal objectives of my analysis are:

1) To contrast the four approaches used by Mr. Loos to value property -- original cost, trended original cost, reproduction cost at current prices and replacement cost -- taking account of IPL's actual performance in constructing, deploying, operating, maintaining and managing its assets.

2) To review, on a conceptual basis, how asset valuation is affected by differences in relative productivity among firms in an industry and to evaluate implications of economic and financial theory in measuring the fair valuation of IPL's property.

3) To measure IPL's relative performance as compared to other electric utility companies in terms of the cost of providing electric service as segregated by distribution, bulk power, and administrative functions.

4) To quantify the extent to which trended original cost inaccurately measures IPL's tangible asset value by not accounting for relative productivity -- excluding value which arises from IPL's name, trademarks or the existence of IPL as a going concern.

Q7. What are the primary conclusions of your analysis?

(a) Using economic and financial principles of asset valuation, regulatory principles of equity and efficiency, comprehensive cost-to-serve data on utility companies, detailed statistical procedures, and my experience in evaluating electric utility company performance, I have reached the following six primary conclusions:

1) The fair value of IPL's property should be computed by simulating valuation techniques which measure asset values in efficient competitive markets.

2) *IPL's performance in managing distribution, transmission, generation and other assets has been exemplary as compared to other investor-owned electric utility companies, and IPL's production costs are much lower than the average price of power from non-utility generating companies.*

3) *Consideration of tangible asset value created from IPL's relative productivity is equitable, efficient and consistent with regulation designed to replicate a competitive marketplace.*

4) *Trended original cost understates the value of IPL's assets by $992 million, while replacement cost and reproduction cost at current prices understate the value of IPL's assets to a far lesser degree.*

5) *The $992 million amount by which trended original cost understates IPL's asset value is significantly less than the 1.7 billion dollars of savings that IPL's customers have actually realized over the last twelve years from IPL's performance relative to other companies in the electric utility industry.*

Q8. Summarize the principal findings of your analysis which led you to reach the above conclusions.

(a) 1) ***Asset Valuation Must Correspond to Competitive Market Models:*** The fair value of IPL's assets should parallel valuation of assets which are determined in efficient competitive markets. Establishing the level of asset value for purposes of pricing according to replacement cost of new property is fair to IPL customers as well as IPL's shareholders and it leads to both efficient allocation of financial resources and efficient use of electric power.

2) ***Fair Valuation of Assets Should Consider Relative Performance:*** In competitive markets, owners of assets realize changes in value of their property because the productivity of their facilities differs from the productivity of assets owned and managed by other firms in its industry. The competitive market model dictates that fair value of IPL's property must recognize IPL's asset productivity relative to the productivity of other electric utility companies. Because of management activities related to construction cost performance, effective asset deployment, fuel purchasing efficiencies, and many other management practices, IPL has, and will continue to, generate, distribute, transmit and sell electric energy at low cost. IPL's performance implies that its productivity, and current state of efficiency of it's property, is significantly above trended original cost as measured by inflating initial construction cost.

3) ***IPL's Cost Performance Has Been Exemplary:*** In managing and deploying its assets, IPL has created significant, tangible asset value through realizing lower costs-to-serve than the vast majority of other investor-owned electric utility companies in the United States. IPL's 1993 cost-to-serve compared to the national average of investor-owned electric utility companies on a dollar per MWH basis is shown in Table 1 below:

TABLE 1
1993 COST-TO-SERVE PER MWH (DOLLARS PER MWH)

	IPL	AVERAGE OF 125 INVESTOR OWNED UTILITIES	IPL AS PERCENT OF AVERAGE
Distribution Cost	$6.78	$10.27	66.0%
Transmission Cost	2.09	4.15	50.4%
Production Cost	29.63	42.29	70.1%
Administrative and Other Cost	6.28	10.30	61.0%
Total Excl State and Local Taxes	44.78	67.01	66.8%
Overall Retail Rates	49.47	72.23	68.0%

IPL's ability to complete all major functions of electric utility operations at costs which are 30-40% below the industry norms is strong evidence that IPL's management has created significant value by achieving higher productivity than other electric utility companies through efficiently deploying, constructing, operating and maintaining its assets. IPL's low cost-to-serve is the principal reason that IPL's retail rates are 68% of the national average.

The high productivity of IPL's assets -- i.e. the ability of the assets to provide electricity at low cost -- is suggested by several independent analyses. For example, analysis of production costs published by the Utility Data Institute ("UDI"), which I have attached as Petitioner's Exhibit ECB-1, Schedule 1 illustrates IPL's low operating costs. This analysis shows that IPL realized lower production costs than any other utility company east of the Mississippi River over the five year period from 1988 to 1992. IPL's low cost is also demonstrated in a regional generation cost analysis published by Moody's investor services, results of which I have attached as Petitioner's Exhibit ECB-1, Schedule 2. The

Moody's analysis shows that IPL has dramatically lower production cost than any other electric utility company in the "Michigan Competitive Arena".

4) ***<u>From 1982 To 1993 IPL Has Created Very Substantial Value By Maintaining Low Cost-to-Serve:</u>*** Through applying statistical techniques to cost-to-serve data for IPL and 124 other U.S. investor owned utility companies, I have quantified the dollar value which IPL has created (or lost) by performing better (or worse) than other electric utility companies. My approach adjusts the comparison for differences in cost-to-serve which are unrelated to management decisions, but instead are due to service territory and other influences. Table 2 demonstrates that since 1982, the incremental value created by IPL has ranged between $86 million and $185 million per year and has averaged $139 million. In 1993, the value IPL generated by achieving low cost was 30% percent of IPL's total electric revenues.

TABLE 2[2]
ANNUAL VALUE CREATED BY IPL ($ 000'S)

YEAR	DISTRIBUTION VALUE CREATION	BULK POWER VALUE CREATION	ADMINISTRATIVE AND OTHER VALUE CREATION	TOTAL ANNUAL VALUE
1982	$13,716	$95,905	$6,982	$116,603
1983	13,592	106,141	6,776	126,509
1984	16,216	110,974	6,441	133,631
1985	16,432	103,631	11,253	131,316
1986	18,428	52,975	14,795	86,197
1987	16,613	86,563	16,136	119,312
1988	12,001	108,824	16,383	137,208
1989	16,094	114,498	11,764	142,356
1990	15,139	122,844	14,553	152,537
1991	18,681	144,670	16,799	180,150
1992	14,367	129,273	16,532	160,172
1993	21,812	134,215	28,754	184,781
TOTAL	$193,092	$1,310,513	$167,167	$1,670,772
AVERAGE	$16,091	$109,209	$13,931	$139,231

If IPL operated in an unregulated competitive market, the dollar amounts shown in Table 2 would have been realized by IPL shareholders. This means that the cash flow generated from relative performance would have been available to the company for reduction in external financing requirements or for increased dividends, and IPL's market value would include the value generated from relative performance.

Table 2 demonstrates that, on a nominal basis, without assuming any earnings from re-investment or any value prior to 1982, the

[2] The quantification of these values is derived from comparing IPL's actual cost-of-service with its expected cost-of-service. The methodology is explained in detail in subsequent sections of my testimony.

total value created by IPL's differential performance is 1.7 billion dollars. I emphasize that the performance data in Table 2 excludes service territory and other factors which give rise to inherent cost-to-serve differences between utility companies. For example, the calculations adjust for IPL's compact service territory, its relatively low residential sales mix and its relatively high energy usage per customer. The values shown in Table 2 arises because IPL is able to sell electricity using fewer economic resources than other companies in the industry, which implies that the productivity of its property (or the state of efficiency of its assets) is significantly better than most other electric utility companies.

5) ***Trended Original Cost Significantly Understates the Value of IPL's Property By Failing to Consider Relative Productivity:*** Trended original cost understates the fair value of IPL's property because it does not account for value created from relative performance. In fact, the exercise of trending initial cost penalizes IPL investors because IPL has generated a significant amount of value through out-performing other companies in constructing, deploying, operating and maintaining its assets. By quantifying the relative state of efficiency of IPL's assets which would be included in an asset sale transaction (without any consideration to on-going value or goodwill) I compute that trended original cost understates the fair value of IPL's property by $992 million. Reproduction cost at current prices and replacement cost are better measures of fair value than trended original cost because these approaches to some extent consider relative performance.

6) ***Measurement Of The Productivity of IPL's Assets Is Not Significantly Impacted By Comparing Costs To Non-Utility***

Generation: The performance measurements for IPL which I develop are not significantly affected by comparing IPL generation costs with costs incurred by non-utility generators ("NUGs") instead of the statistically adjusted cost-to-serve of other electric utility companies. The average 1991 generation price per kWh for NUGs of 6.14¢ was 45% greater than the average generation cost of 4.23¢ for investor owned utilities and the NUG cost was 107% higher than IPL's production cost of 2.96¢ per kWh.

TABLE 3[3]
COST OF GENERATION : CENTS PER KWH

NON UTILITY GENERATION AVERAGE PRICE	6.14¢
AVERAGE 1993 PRODUCTION COST FOR U.S. UTILITIES	4.23¢
IPL 1993 PRODUCTION COST	2.96¢

7) ***Consideration of Performance in Fair Value Rate Base is Not an Incentive Target:*** Recognition of relative productivity in measuring fair value of IPL's property is very different from incentive mechanisms which have been proposed in various other regulatory proceedings. Incentive schemes generally involve granting increased returns if some future target is met, while my analysis relates to actual performance realized by IPL in managing its electric properties from construction efficiency, fuel contracting, and operating policy. To the contrary, my testimony demonstrates that correctly measuring fair value will naturally reward or penalize performance.

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[3] The source of this data is contract costs reported to FERC. The data is described in Section XI of my testimony.

Q9. Describe the $992 million which you determine to be the amount by which IPL's trended original cost understates the value of its property.

(a) I have determined that because the productivity of IPL's assets exceed the productivity of assets deployed by most other electric utility companies, $992 million could be realized by IPL's investors above trended original cost in an asset sales transaction. This value arises because IPL's assets are able to serve the needs of electricity customers using fewer economic resources than the assets of most other electric utility companies. My computation incorporates the differential productivity of IPL's assets but it does <u>not</u> include any consideration for value which IPL has created by virtue of its franchise rights, by its name or trademark, by virtue of its service territory existence in Indianapolis[4], or by virtue of its on-going future ability to create value in the future (i.e. there is no going-concern or goodwill value).

The $992 million amount by which IPL's trended original cost understates value consists of the following components:

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[4] The performance value calculation accounts for regional differences between IPL's service territory and other service territories due to population density, usage characteristics, cost of living and other factors.

TABLE 4
AMOUNT BY WHICH TRENDED ORIGINAL COST UNDERSTATES VALUE OF IPL'S PROPERTY
($ MILLIONS)

DISTRIBUTION	$ 100.2
BULK POWER	$ 825.5
ADMINISTRATIVE AND OTHER	$ 66.3
TOTAL	$ 992.0

Q10. Discuss your understanding of the Indiana Public Utility Statute relating to "current state of efficiency" and "tangible property".

(a) My understanding of the terms "state of efficiency" and "tangible property" as they relate to the fair value of IPL's property is that (1) valuation methods must consider the relative productivity of IPL's assets ("state of efficiency") and (2) value derived from IPL's existence as a going concern is not allowable as a component of rate base. The distinction between value which is tangible as opposed to non-tangible can be highlighted through review of the following nine valuation illustrations:

1) Assume that two identical cars were purchased five years ago and the owner of the first car maintained his car well -- he changed the oil, kept it in a garage, and drove it carefully -- while the owner of the second car neglected maintenance, left it outside and drove it recklessly. Clearly, the state of efficiency and current fair market value is better for the first car than for the second car because of

company with state-of-the-art management systems.

7) Assume two banks are being considered for purchase by a larger bank, and one bank has name recognition and an established customer base while the second bank has no such "franchise" value. In this transaction the first bank may have relatively more name recognition, goodwill, or trademark value than the second bank, however, this value has been generated because of the bank's operation as a going concern and the value is therefore <u>not</u> tangible.

8) Assume that in acquiring a natural gas company, a prospective purchaser will pay more for a local distribution company with a monopoly franchise than for a gas gathering company with no secure customer base. The company with the franchise will probably carry a value premium relative to the company without a customer base, however this value is derived simply from the company's existence as a public utility and is therefore not tangible property.

9) Assume that a law firm is highly profitable because of the skills of one of its lawyers. However, if the firm is sold, the lawyer will not continue his employment. In this case, the value contribution by the skilled lawyer is not tangible property because it only exists when the company is a going concern and the value would cease to exist if the firm was sold.

In the remainder of my testimony I quantify value which has been generated from the relative productivity of IPL's assets which is similar in various respects to the examples one through six above. I emphasize that my quantification of value does not include any non-tangible value derived from name, trademark, location or IPL's existence as a going-concern analogous to the final three examples.

IPL has been able to deploy and operate its assets in a manner which results in lower costs (i.e. higher productivity) than other companies analogous to the two car and the apartment building illustration; IPL's

historical record in constructing assets at a lower cost than other companies is similar to the house construction example; IPL's skill in securing fuel and purchased power at low cost is comparable to the co-generation situation; IPL's low costs for administrative functions is similar to the airline company transaction; and, IPL's deployment of transmission, distribution and generation assets is analogous to the aluminum smelter locations. On the other hand, in quantifying performance value, I do not attribute any value to IPL's name, trademark or other goodwill as in the bank sale case; nor do I attribute value to IPL's franchise rights as in the natural gas company example; nor do I quantify value which is realized by on-going superior performance which would cease with an asset sale as with the law firm example.

Q11. Please outline the remainder of your testimony.

(a) The structure of my remaining testimony corresponds to the ordering of the conclusions I discussed in question 8. First, I review theoretical issues associated with IPL's fair value rate base where I conclude that fair value must reflect relative performance. Second, I discuss how the relative performance and productivity of electric utility companies can be simulated from cost-to-serve models. Third, using cost-to-serve statistical models, I quantify the dollar value created by IPL in terms of distribution,

bulk power, and administrative functions. Fourth, I discuss issues related to cost comparisons with non-utility generators and incentive regulation.

III. THEORETICAL BASIS FOR CONSIDERING RELATIVE PRODUCTIVITY IN VALUING ASSETS

Q12. Describe the regulatory principles which should be used to measure the fair value of IPL's property.

(a) Two fundamental principles which should guide most regulatory policies are economic efficiency and fairness. These two principles provide the best conceptual basis for evaluating the fair value of IPL's property. I describe below how, in computing fair value for IPL, efficiency and equity are achieved by measuring asset values in the same manner as assets are valued in normal unregulated industries.

The principle of equity (i.e. fairness) can be evaluated by considering the economic position of IPL's customers and its shareholders relative to what their position would be in an efficient competitive market. The shareholders of IPL should not receive lower value for their investments than the value which would be established through pricing which occurs in unregulated competitive markets. In sum, both product prices and

asset values must be consistent with competitive markets in order for customers and shareholders of regulated firms to be in an equitable situation relative to customers and shareholders of companies which operate in normal unregulated markets.

The regulatory principle of <u>efficiency</u> can be defined in terms of the pricing of electricity relative to the pricing of other goods and services in the economy and in terms of the valuation of IPL's common stock relative to the valuation of other financial securities. Unless product prices as well as asset values of regulated companies parallel conditions in efficient competitive markets, resources will be mis-allocated between regulated and unregulated firms. Inefficient resource allocation will occur because there are competing investment alternatives available to suppliers of capital and because there are alternative uses for the resources which have been dedicated to providing electricity services. For example, if the price of electricity is too low, excessive consumption may be encouraged and other products in the economy will be under-utilized. Similarly, if asset values of regulated firms do not correspond to values which would occur for unregulated firms, owners may have distorted incentives such as transferring assets out of regulation, under-investing in capital projects, or "gold-plating" utility property.

Q13. Describe how asset valuation occurs for unregulated firms in competitive markets.

(a) Valuation of assets which occurs in the American capital marketplace is derived from computing the present value of future cash flows. One of the basic characteristics of valuation in financial markets is that asset values change over time because value is derived from the cash flow streams which arise from investments in new assets. The value of assets is computed on the basis of the present value of cash flows and it equates to the price that a willing buyer will pay a willing seller in an asset sale.

When firms initially make investments in unregulated industries, rate of return is expected to, at minimum, cover the cost of capital associated with the investment. However, actual realized returns virtually always differ from initial expectations over the lifetime of a capital investment. For example, some firms are able to achieve relatively high cash flow and asset value by virtue of good performance while other firms may experience declines in value because of declining productivity. Recall the apartment building example I described earlier. Even though the two apartment buildings may initially have had the same expected returns, increases in cash flow associated with the efficient apartment building imply that its value increased relative to the inefficient building.

Q14. How does the value of a firm's assets change over time in an unregulated competitive market?

(a) For a firm operating in an unregulated market, the value of assets changes over the operational life of an asset for many reasons as plants age. Three of the primary reasons include (1) changes in the measurement basis for valuing assets (i.e. changes in the purchasing power of a dollar, or inflation); (2) changes in the value of existing assets because the productivity of new assets in the industry has increased or decreased; and, (3) changes in the value of assets which arise from performance of the company compared with the rest of the industry in terms of relative asset efficiency. I address each of these reasons for changes in asset value below:

1. <u>Purchasing Power in the Economy</u>: Valuation of assets incorporates changes in the purchasing power of a dollar over time in efficient markets because of the simple and fundamental fact that assets of differing age vintages must be valued using a consistent basis of measurement. To illustrate why assets must be valued using a uniform yardstick, consider how residential real estate is valued in purchase and sale transactions. If the value of real estate is not measured with current dollars but instead is measured using the historical purchase price of a home, transactions to buy and sell real estate will be completely distorted and resources will not be allocated efficiently. Because of past inflation, if real estate were valued at its initial cost in transactions, buyers would attempt to purchase real estate based on its age rather than its inherent

benefits. Due to the long life of assets deployed in the production, transmission and distribution of electric power, many relatively old assets are still highly productive and value distortions of electric utility assets caused by inflation are very significant.

2. Industry Productivity: The value of a company's assets reflects current technology which is available in an industry. Over time, productivity changes in an industry relative to other industries in the economy is therefore incorporated in the valuation of existing assets. If the productivity of new assets deployed in an industry increases or decreases as compared to other industries, the value of existing assets will reflect these productivity changes. The impacts of productivity changes can be illustrated by the example of personal computers. Even though the initial cost of a personal computer with a 286 micro chip purchased a few years ago was probably more than today's cost of a 486 computer, the improvements in productivity which have occurred in the computer market means that today's value of the old 286 personal computer will be lower, reflecting current technology. Unless value of the older 286 computers is reduced to account for current available technology, there will be no market for purchasing an existing computer and no transactions will occur to buy or sell the 286 computers. Unlike the computer industry, the electric utility has not experienced significant productivity improvements in recent years. Rather, productivity improvements which generally existed prior to the mid-1970's in generating plant construction have been often replaced by increases in the real cost of construction. Similarly, because of difficulties in acquiring permits and other factors, the real cost of constructing transmission assets has generally increased.

3. Firm Performance: The value of a firm's assets incorporates the performance of a company in managing its assets relative to other companies in the industry. The example of two firms (company A and company B) which own and operate apartment buildings

illustrates how value can be affected by performance. The current market value of both firms is derived from the present value of cash flows earned from rental properties less the cost of operating the businesses. Assume company A realizes strong cash flows because its assets are strategically deployed, its costs are efficiently controlled, and its vacancy rate is minimized, while company B realizes weak cash flows because investments are not made in strategic locations, costs are excessive and vacancy rates are high. In a competitive market, where the value of assets reflects cash flow, investments made in company A will have greater tangible value than investments made in company B. In my testimony below, I quantify the value IPL has generated differently from other electric utility companies.

Q15. Should these three factors (inflation, productivity, and performance) be considered in establishing the fair value of IPL's property?

(a) Absolutely. All three of these components must be incorporated in measuring the fair value of IPL's property. Only by incorporating changes in the value of assets due to inflation, industry productivity, <u>and</u> differential performance will fair value lead to efficient allocation of resources, and only if all three factors are included, will IPL's fair value be equitable to both shareholders and customers. It is crucial that a differential performance component be considered in IPL's fair value because recognizing the tangible value created from performance will ultimately mean that a highly important resource in the economy - management talent - will be efficiently allocated.

Q16. How should fair value of assets be determined for a company whose prices are regulated?

(a) Where prices are set using a regulatory procedure, a model of asset valuation is required to establish an income stream to investors. Since market valuation of regulated firms is driven to a great extent by the regulatory policies used to set prices, the value of regulated firms' securities in financial markets largely reflect regulation rather than the drivers of value (including performance) which are the basis for asset valuation in unregulated markets. This means that in order to obtain the goals of equity and efficiency, valuation of assets for a company whose prices are regulated must be modelled from valuation which occurs in unregulated markets. It also follows that the valuation of assets for a regulated company must include a component for performance.

If valuation methods used to set rates for a regulated firm correspond to principles from competitive markets, and if rate of return is appropriately established, prices will be set at levels which are efficient from the standpoint of resource allocation, and cash flows will encourage appropriate levels of investment in the industry. Indeed, only in the situation where fair value rate base is equated to asset valuation which exists in unregulated markets, will prices be set at levels that encourage

efficient use of resources, and only in this situation will resources be allocated in an equitable manner between customers and stockholders.

IV. MEASUREMENT OF ASSET VALUE USING ORIGINAL COST, TRENDED ORIGINAL COST, REPLACEMENT COST, AND REPRODUCTION COST AT CURRENT PRICES

Q17. Does original cost result in appropriate valuation of IPL's assets for purposes of setting prices?

(a) No. Value of assets measured by original cost does not replicate asset valuation which occurs in unregulated markets. Use of original cost as a measure of fair value rate base creates inefficient pricing, perverse incentives, and inequitable allocation of resources as between customers and shareholders. Some of the problems with using original cost to measure fair value include:

1. Original cost does not take account of changes in value which arise from inflation. Therefore, if original cost is used as a basis for measuring value, the "real" level for prices of electricity are distorted over time. "Rate shock" which occurs from placing new plant in service is a direct result of original cost ratemaking and not accounting for inflation in asset valuation because of the "front-end loading" of returns which arises from original cost.

original cost without provision for relative asset productivity does not value assets in a consistent manner with unregulated markets and it leads to problems in terms of both equity and efficiency.

Valuation of assets using trended original cost takes account of purchasing power changes because the Handy-Whitman index or other trend factors account for inflationary impacts on cost escalation. However, while trended original cost accounts for inflation, it does not recognize the relative state of efficiency of assets from performance of a company in deploying, constructing or operating assets. In fact, trended original cost has the same flaws as original cost in terms of lowering asset valuation for companies that have been efficient in construction of assets and increasing value in cases where companies have been inefficient or gold plated their facilities.

Q19. Summarize replacement cost and reproduction cost at current prices as approaches to measurement of the fair value of IPL's property?

(a) Replacement cost recognizes that if IPL's system were replicated today with current available technology, the type of assets might be different than IPL's existing assets. Reproduction cost at current prices measures the cost to replace IPL's existing facilities at current market prices of

those facilities.

Inflation is accounted for in computation of replacement cost because the currency value used in valuing assets is current dollars rather than "deflated" original cost dollars. Because valuations use the cost of replacing equipment with today's technology, replacement cost and reproduction cost at current prices also encompass changes in the value of existing assets resulting from changes in the productivity. For example, if productivity improvements cause real costs to decline over time, this will be reflected in lower asset values. Alternatively, if real costs in the industry increase, replacement cost will have a higher value than inflated original cost.

Unlike original cost or trended original cost, the calculation of replacement cost or reproduction cost at current prices does not penalize investors for efficiently constructing assets. The following simplified example illustrates this point:

Age of Plant	30 Years
Initial Cost For Firm	$100
Average Initial Cost in Industry	$150
Trend Factor	3.5
Trended Cost For The Firm (100 x 3.5)	<u>$350</u>
Trended Cost For The Industry (150 x 3.5)	<u>$525</u>

The above example shows that simply by virtue of efficiently constructing

assets many years ago, the trended cost of assets can be very different from the reproduction cost at current prices. A $50 cost difference thirty years ago ($150-$100) translates to a $175 ($525-$350) cost difference today.

If a company has been efficient in constructing plants and has historically achieved low construction costs relative to other companies, trended original cost will generally result in a lower value than replacement cost or reproduction cost at current prices. That is, replacement cost and reproduction cost at current prices do not have the distortions of original cost and trended original cost in terms of lowering value for efficiently constructing facilities.

Q20. Have you investigated trended original cost measured using the Handy-Whitman index compared with replacement cost in the context of IPL's initial construction costs?

(a) Yes. I have compared the cost of IPL'sgenerating units to the cost of similar sized units built during a similar time frame in the Midwest. For example, Petersburg 4, completed in 1986 has a summer capacity of 515 MW and had an initial construction cost of $500.3 million which results in a per KW cost of $971/KW. In 1985, Belle River 2, a plant with 645

MW of summer capacity was completed at a cost of $1,360/KW; in 1986 DB Wilson 1, a unit with summer capacity of 440 MW, was completed at a cost of $1,894/KW and RM Shafer 18, a unit with summer capacity of 361 MW was completed with a cost of $1,160/KW. In addition to these comparisons, I have compared the initial cost of IPL's generating plants with replacement cost deflated by the Handy-Whitman index. This exercise demonstrates that IPL's units had a lower cost than deflated replacement cost. Finally, I have reviewed available FERC Form 1 data with respect to the cost of IPL units as compared to the cost of similar plants. My investigation demonstrates that IPL has consistently been efficient in the construction of its generating units.

Q21. Compare replacement cost with trended original cost as a basis for computing fair value?

(a) Both replacement cost and trended original cost are significant improvements compared with original cost as a basis for measuring IPL's fair value rate base, because original cost ignores changes in the purchasing power of a dollar which have occurred over the long lifetime of electric utility assets. Replacement cost is clearly a superior method to trended original cost, because replacement cost does not distort valuation by using historical costs as the base for measuring current value. Since

IPL has generally realized lower construction costs than other utility companies or the industry trend index, replacement cost should exceed trended original cost for IPL. On the other hand, had IPL performed worse than the industry in terms of construction cost assets, I would expect replacement cost to be below trended original cost.

In the remainder of my testimony I quantify the extent by which trended original cost understates the fair value of IPL's property. My approach measures the productivity of IPL's assets relative to other electric utility companies and it accounts for differences among firms in construction cost.

Q22. Does replacement cost fully account for asset values which exist in competitive markets.

(a) No. In competitive markets, many firms realize higher market value for their assets than replacement cost, because the current state of efficiency of their assets exceeds that of other company's assets. In these cases, the assets of a firm are more valuable than the dollar amount that could be realized if its assets were liquidated at replacement cost. Indeed, unless a company can manage its operations in such a way as to have a market value which equals or exceeds its asset replacement cost, the

company should theoretically liquidate itself. In effect, a comparison of market value with replacement cost reveals whether a firm is worth more dead or alive.

The ratio of market value to replacement cost has been named the "q ratio" and has been used to measure management performance of industrial firms in a number of academic studies. The theory behind q-ratios is very similar to the concept that fair value of property should consider the current state of efficiency of assets. The importance of including the q ratio in valuation is described by Nobel Laureate James Tobin:

> "the market valuation of equities, relative to the physical assets they represent, is the major determinant of new investment. Investment is stimulated when capital is valued more highly in the market than it costs to produce it, and discouraged when its valuation is less than its replacement cost."[5]

Q23. Describe how tangible value of property can differ from replacement cost for an electric utility company.

(a) The notion that management performance can generate tangible value and

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[5] William C. Brainard and James Tobin "Econometric Models: Their Problems and Usefulness", American Economic Association.

cause asset values to differ from replacement costs can be illustrated using the example of fuel supply. By successfully obtaining fuel supplies at costs significantly below the cost of similar fuel for other companies, an electric utility company can enhance the productivity and state of efficiency of its generating assets.[6] If the company operated in an unregulated market, the difference (in present value) between its fuel cost and the future fuel cost of the other firms would be embodied in the market value of its assets. However, the difference in value created by efficiently securing coal supply would <u>not</u> be measured as a component of replacement cost. Therefore, all else equal, because of efficiency in obtaining low cost fuel contracts, the ratio of market value to replacement cost for the electric utility company -- the q-ratio -- should be greater than the q-ratio for companies which have been less efficient in contracting for fuel.

IPL has in fact demonstrated exemplary performance in achieving low-cost fuel supply analogous to the example I described above. Indeed, an important reason for IPL's good operating cost performance shown in <u>Petitioner's Exhibit ECB-1</u> (the UDI survey and the Moody's analysis) is its low cost fuel supply. IPL's low costs are demonstrated in Table 5 which

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[6] The tangible value of fuel contracts was very obvious for take-or-pay gas contracts signed by natural gas transmission companies. These contracts caused large swings in market value of assets, book writeoffs and even bankruptcy.

compares Indiana electric utilities in terms of contract cost per MMBtu for coal purchased from the Illinois Basin:

TABLE 5
COST OF CONTRACT COAL FOR IPL
AND OTHER INDIANA ELECTRIC UTILITIES

UTILITY COMPANY	COST CENTS/MMBTU	1993 CONTRACT TONS (OOO)	CONTRACT EXPIRATION	% SULPHUR
Indianapolis Power & Light	111.94	3,986	1997-2013	2.36
Hoosier Energy	136.83	2,569	1995-2005	3.28
PSI Energy	139.26	7,326	1995-2005	2.02
Indiana Michigan Power	140.21	1,053	1995-1997	2.41
Northern Indiana Public Service	142.59	1,398	1998	3.04
Southern Indiana Gas & Electric	172.10	949	1995-1999	3.04

V. OVERVIEW OF MEASURING VALUE FORMATION FOR REGULATED COMPANIES

Q24. Can differences in the state of efficiency of electric utility companies generally be observed in the market value of financial securities?

(a) No. When cost-plus regulation is used as a basis for setting the prices, a model must be applied to measure the amount of value created by relative performance. For example, if valuation of assets is (inappropriately) modelled using original cost, the market value of a regulated company will be driven by the level of historical asset cost. This implies that if original cost is used to set rates, attempts to measure fair value from pricing of

financial securities will result in a circular self-fulfilling prophecy. On the other hand, since prices of regulated companies are generally based on cost, productivity and performance can be observed more from information on relative rates and cost-to-serve than from data on the value of financial assets.

Differences in the state of efficiency of assets for an electric utility company arise from construction cost of assets, management of operation and maintenance costs, decisions on how to deploy facilities, procurement of fuel and other materials, achievement of high power plant availability and so forth. As I describe in detail below, IPL's asset productivity as measured by costs relative to other companies in the industry has been exemplary, and valuation of its assets in a competitive market would be increased because of this fact.

Q25. What groups of utilities do you compare with IPL in evaluating performance?

(a) In analyzing IPL's performance, I compare IPL to 124 other U.S. investor owned electric utility companies which are covered in a database compiled by the Utility Data Institute ("UDI"). These companies include all the electric utilities which have complete FERC form 1 data in the UDI database for the period 1982 to 1993. A list of the 125 utility companies

(including IPL) is shown on Petitioner's Exhibit ECB-2. I am able to use a comprehensive data base in evaluating the productivity of IPL's assets because I adjust the comparisons for service territory factors and other cost differences which cannot be controlled by management.

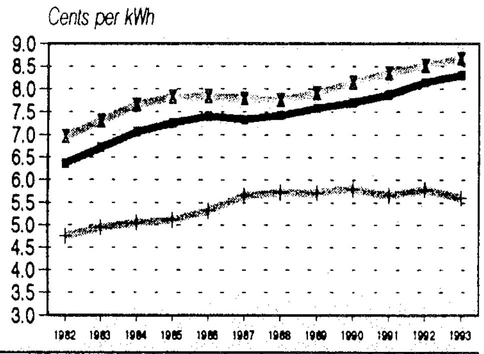
Q26. What do rate comparisons reveal about IPL's performance?

(a) A crude measure of management performance for electric utility companies is a company's rate level compared to the level of rates of other utilities. Differences in cost-to-serve are exhibited in rates because the nature of electric power (i.e. a kWh of electric energy) is similar for most electric utility companies.

Comparison of revenue per kWh between electric utility companies in the U.S. demonstrates that customers of IPL pay low rates relative to most other utility companies. Because IPL has no special circumstances such as low cost hydro power, advantageous load factors, or a low residential sales mix, IPL's low rates are evidence of strong management performance. Figure 1 shows IPL residential, commercial and industrial, and overall retail revenue per kWh compared to the national average of 125 investor owned utility companies. IPL stands out in the comparative rate data because many of the high rate companies serve relatively large

Figure 1
Revenue per kWh from 1982 to 1993

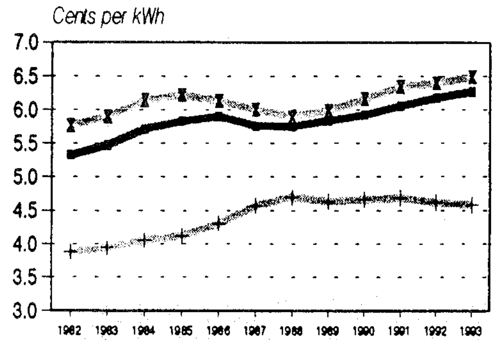
Residential Revenue per kWh



	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
US AVERAGE	7.0	7.3	7.7	7.8	7.8	7.8	7.8	7.9	8.1	8.4	8.5	8.7
IPL	4.8	4.9	5.1	5.1	5.3	5.7	5.7	5.7	5.8	5.7	5.8	5.6
SIMILAR CITIES	6.4	6.7	7.1	7.3	7.4	7.3	7.4	7.6	7.7	7.9	8.1	8.3

US AVERAGE + IPL ● SIMILAR CITIES

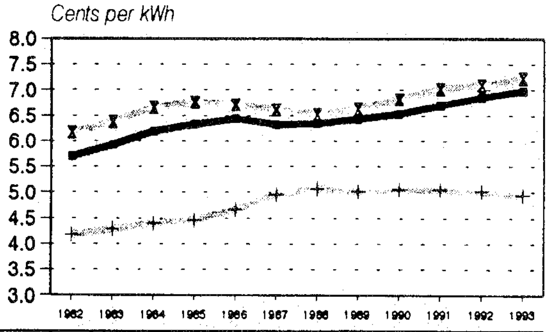
Commercial and Industrial Revenue per kWh



	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
US AVERAGE	5.8	5.9	6.1	6.2	6.1	6.0	5.9	6.0	6.2	6.3	6.4	6.5
IPL	3.9	3.9	4.1	4.1	4.3	4.6	4.7	4.6	4.7	4.7	4.6	4.6
SIMILAR CITIES	5.3	5.5	5.7	5.8	5.9	5.8	5.7	5.8	5.9	6.1	6.2	6.3

US AVERAGE + IPL ● SIMILAR CITIES

Total Retail Revenue per kWh



	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
US AVERAGE	6.2	6.4	6.7	6.8	6.7	6.6	6.5	6.6	6.8	7.0	7.1	7.2
IPL	4.2	4.3	4.4	4.5	4.7	5.0	5.1	5.0	5.1	5.0	5.0	4.9
SIMILAR CITIES	5.7	5.9	6.2	6.3	6.4	6.3	6.3	6.4	6.5	6.7	6.9	7.0

US AVERAGE + IPL ● SIMILAR CITIES

metropolitan areas while few of the other low rate companies have densely populated service territories analogous to IPL's service area.

Q27. Describe Figure 2 which compares 1993 rates of IPL with investor-owned utility companies that serve similar sized metropolitan areas as Indianapolis.

(a) In presenting data on rates and cost-to-serve information it is instructive to compare IPL with other utilities on a company by company basis. For illustrative purposes I compare IPL to electric utility companies which serve similar sized metropolitan areas as Indianapolis.[7] Utilities which serve similar-sized metropolitan areas as Indianapolis can be instructive because these utility companies often share many characteristics such as housing types, environmental requirements, population density and cost of living which impact relative cost-to-serve.

My sample of electric utility companies which serve similar-sized metropolitan areas include IPL and 20 investor owned utility companies located in metropolitan areas that have populations similar in size to Indianapolis. I have established this group of investor owned utility companies by simply selecting the twelve U.S. metropolitan areas with population ranking above Indianapolis and the twelve areas with

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[7] I emphasize that none of the statistical models were limited to similar sized city sample as a basis for deriving equations or for measuring the dollar amount of tangible value.

population ranking below Indianapolis, based on the 1990 census. Specifically, the Indianapolis metropolitan area had a population rank of 31 and I selected each metropolitan area ranked from 19th through 43rd which is also served by an investor-owned utility company. The electric utility companies included in this group are shown on Petitioner's Exhibit ECB-3.[8]

Figures 1 and 2 illustrate that if rate comparisons are used to measure relative productivity, IPL's performance is exemplary. Indeed, figure 2 demonstrates that the only two utility companies with lower overall revenue per kWh than IPL are Pacificorp (serving Salt Lake City), and Puget Power & Light (serving Seattle) - both which have substantial access to low-cost hydro power.

Q28. What problems arise from using rate comparisons to measure the relative performance of electric utility companies?

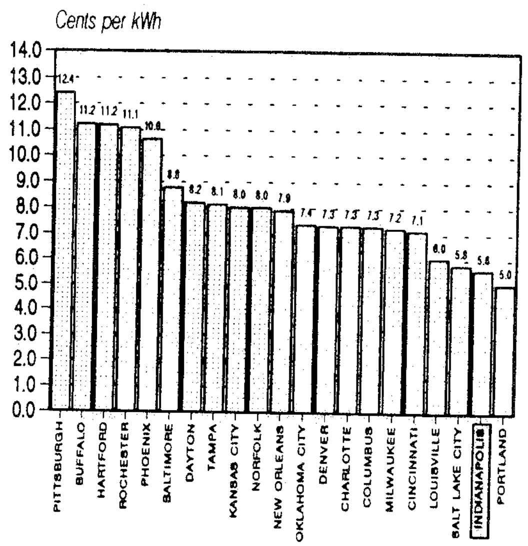
(a) Using rate comparisons to gauge the relative performance of electric utilities has a number of problems, some of which include:

1. Rate comparisons between electric utility companies are influenced

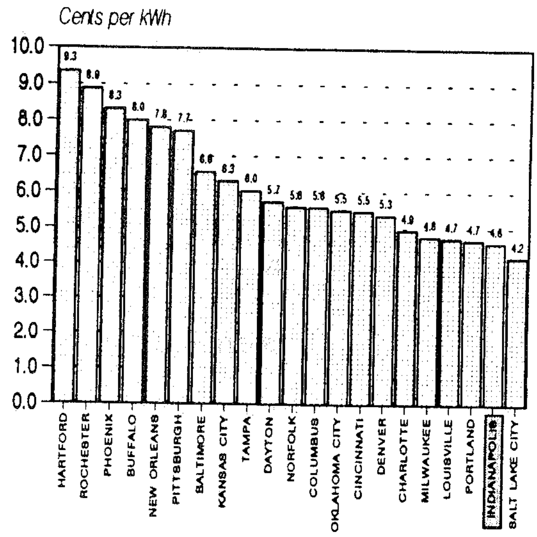
[8] Cities which are served by non-investor-owned utility companies are not included in the comparison base.

Figure 2
Revenue per kWh in Indianapolis and Similar Sized Metropolitan Areas

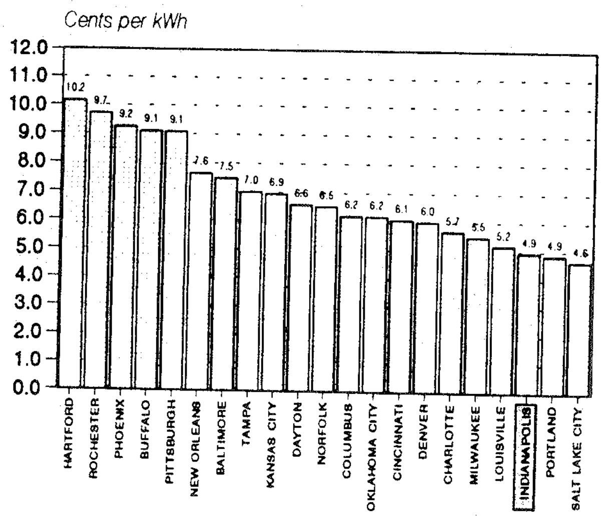
1993 Residential Revenue per kWh



1993 Commercial and Industrial Revenue per kWh



1993 Total Retail Revenue per kWh



by the rate of return which is realized by a company. However, for regulated electric utility companies, the level of earned return generally has nothing to do with performance in managing assets. For instance, low rates experienced by an electric utility company may reflect harsh treatment by regulators rather than skillful management of assets.

2. Rate comparisons between utility companies for individual customer classes are significantly affected by differing rate design policies. Furthermore, overall retail rate comparisons between utility companies are often biased by the relative proportion of energy sales to the different customer classes. If a company has a high proportion of industrial sales, its overall rates should generally be lower than overall rates for a company which has a high proportion of residential sales.

3. State and local taxes which are imposed on utility companies and reflected in rates can significantly impact rate comparisons. If a company incurs a high level of taxes in its rates, it will tend to experience relatively high rate levels, and the portion of rates which represents collection of these taxes has nothing to do with management performance. For example, the 1993 level of state and local taxes paid by Consolidated Edison (2.7 cents per kWh) is three quarters of the total level of rates for Idaho Power (3.8 cents per kWh). The cost-to-serve calculations described below directly account for state and local taxes.

4. Because of differences in the nature of service territories, rate comparisons are significantly affected by the characteristics of the service area. There are differences in factors such as wage and real estate costs for various regions of the country and, all else being equal, rates should be higher for areas where cost of doing business is relatively high. The econometric analysis I develop to evaluate relative productivity considers these service territory factors.

5. Cost-plus regulation (which in most states is unfortunately derived from original cost), causes rates to be influenced by accounting conventions for recording depreciation expense and the level of net book value of assets. Therefore, rate differences between companies often simply reflect age of plant and rates of book depreciation rather than the management of assets. The econometric equations I present below include variables to account for age and depreciation rates.

Q29. Is comparison of cost-to-serve between electric utility companies an effective way to measure the relative performance?

(a) Yes, if comparisons are normalized for differences in service territory and other influences so that relative productivity of assets can be isolated from factors which are outside the control of management. That is, the performance of electric utility companies can be gauged by comparing relative cost-to-serve levels among companies *as long as* cost-to-serve is adjusted for influences beyond the direct control of utility management. In order to adjust cost-to-serve comparisons for factors unrelated to management performance, I develop a measure of *expected* cost-to-serve for each electric utility company. The expected cost-to-serve for a company measures costs which would exist for a company if its performance was at the industry norm. If a regulated company performs well, actual cost-to-serve will be below expected cost-to-serve. On the other hand, if performance is poor, actual cost-to-serve will be above

expected cost-to-serve. For the electric utility industry as a whole, expected cost equals actual cost - i.e. the performance of the whole industry is average.

The approach of measuring actual and expected cost-to-serve has a number of advantages relative to rate comparisons in gauging the relative productivity of assets. First, cost-to-serve computed using an industry-wide rate of return is not biased by differences in rate-of-return resulting from alternative regulatory policy. Second, pre-tax cost-to-serve is not distorted by differences in state and local taxes. Third, cost-to-serve can be dis-aggregated into separate components (distribution, bulk power, and administrative costs) allowing refined analysis of different segments of a company. Finally, by evaluating actual and expected cost-to-serve components using regression analysis, biases related to customer characteristics, service territory factors and accounting influences can be removed.

VI. MEASUREMENT OF ACTUAL AND EXPECTED COST-TO-SERVE

Q30. How do you determine cost-to-serve for IPL and the other companies in the database?

(a) I compute cost-to-serve per MWH for each electric utility company by adding together operating expenses (net of revenues received from wholesale sales), depreciation, and capital costs and dividing the sum by retail energy sales. Operating expenses and depreciation are directly obtained from accounting statements, while capital cost is computed through multiplying net plant by an industry average pre-tax rate of return.[9] I calculate the industry average pre-tax rate of return through dividing operating income before federal income tax by net plant for each company and then averaging the pre-tax rate of return for all companies in the comparison base.[10] By using this method, cost-to-serve is not influenced by tax accounting, by differing capital structure policies, or by differences in rate of return of individual utility companies.

Q31. Describe <u>Petitioner's Exhibit ECB-4</u> which shows details of your cost-to-serve computations using IPL as an example.

(a) To demonstrate my approach for computing cost-to-serve, I show how cost per MWH is computed for IPL, and I reconcile IPL's cost-to-serve with

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[9] I account for the fact that capital costs as defined using net plant are biased because of the age of plant through use of an age variable in the regression equations described below.

[10] Pre-tax operating income is the sum of electric operating income and federal income taxes including current, deferred and investment tax credit. The industry average rate of return is computed on an annual basis.

its retail rate. In Petitioner's Exhibit ECB-4 I use data reported in IPL's 1993 FERC Form 1 to calculate costs for distribution, transmission, generation and administrative and other categories. For each category, capital costs are added to depreciation and operating and maintenance expenses in deriving total cost-to-serve.[11] Line 1 of the exhibit shows net plant for each segment; line 2 shows the industry wide return multiplied by IPL's net plant; line 3 shows depreciation expense by segment; line 4 shows operating and maintenance expenses; and, line 5 shows off-system wholesale revenues which are subtracted from production costs. The fifth column lists the total cost-to-serve for each category in dollars and the sixth column shows cost-to-serve per MWH through dividing the dollar amounts by IPL's retail sales.

Lines 7 through 12 of Petitioner's Exhibit ECB-4 reconcile total cost-to-serve per MWH with retail rates by accounting for state and local taxes as well as differences between IPL's rate of return and the industry-wide rate of return. Line 8 lists net plant multiplied by the difference between IPL's rate-of-return and the industry rate-of-return. Line 9 shows the net other

[11] For generation costs, wholesale revenues from sales for resale are subtracted from operating and maintenance cost. This adjustment is made because retail sales are used in the denominator of cost-of-service per MWH.

income[12] included in rate of return calculations and line 10 displays IPL's state and local taxes. Line 11 shows the sum of total cost-to-serve and the items on lines 8 through 10.

Line 12 demonstrates that IPL's 1993 total retail rate reconciles to the adjusted cost-to-serve. IPL's total 1993 cost-to-serve was $44.79 per MWH (4.479 cents per kWh). When state and local taxes of $2.88 per MWH and rate of return and other adjustments of $3.43 per MWH and -1.63 per MWH are accounted for, the cost-to-serve reconciles to IPL's retail revenues per MWH of $49.48 (4.95 cents per kWh).

Q32. Explain how you developed the cost-to-serve database for the electric utility industry.

(a) To determine the relative performance of IPL, I have created cost-to-serve data for 125 investor owned electric utilities over the twelve year period from 1982 to 1993.[13] Cost-to-serve is computed using the methodology illustrated in Petitioner's Exhibit ECB-4 for each utility company for each year from 1982 through 1993. The computation is made for 125 x 12 or

[12] Net other income includes electric revenues which are neither retail sales nor off-system sales, and expenses which are not categorized elsewhere in the calculations such as amortization of intangibles, loss on disposition of property and amortization of regulatory assets.

[13] The source of the Ferc form 1 data is from the UDI database which includes data from 1982 through 1993.

1,500 data occurrences. This database provides the basis for developing regression equations which derive expected cost-to-serve and ultimately measure the performance of IPL. The computations are made using FERC Form 1 data compiled by UDI.

Q33. Describe your method for computing relative performance and the productivity of IPL's assets using the cost-to-serve database.

(a) I compute relative performance for IPL and the other 124 electric utility companies by comparing actual costs with expected costs. This means that once actual cost is derived, the remaining task is calculating expected cost. I calculate expected cost-to-serve for each utility company from a regression analysis using the database described above. My regression analysis develops a mathematical equation for the expected cost-to-serve from data related to customer characteristics, service territory variables, accounting influences and other factors which cannot generally be controlled by management of utility companies. Conceptually, the model for determining performance for each utility company is illustrated by the following equations:

Performance = Expected Cost - Actual Cost

and,

$$
\begin{aligned}
\text{Expected Cost} = A &+ B \bullet \text{Service Territory Factors} \\
&+ C \bullet \text{Customer Characteristics} \\
&+ D \bullet \text{Accounting Variables} \\
&+ E \bullet \text{Other Factors.}
\end{aligned}
$$

In the above equation, A, B, C, D and E are called coefficients and the service territory factors, customer characteristics and accounting variables are called "explanatory" variables. Once the coefficients are established, expected cost can be computed for any company in the database by inserting company specific values for the explanatory variables and then solving the equation.

I determine the coefficients of the expected cost equation by using a multiple regression analysis on the industry data. This procedure finds the equation for cost-to-serve which best explains how cost varies as the explanatory variables change for the entire group of utility companies over the twelve year period. In more technical parlance, the coefficients of the regression equation are those that minimize the sum of squared differences between the actual realized costs and the expected costs for all of the companies in the database (referred to as least squares).

Q34. What have you done to assure that your measurements of expected costs are

accurate?

(a) Expected cost can be computed incorrectly if a variable is omitted from the regression equation, if a variable which should not be included in the equation is incorrectly included, if explanatory variables are incorrectly measured, or if the use of a linear model with coefficients that are the same across companies is not a good representation of actual relationships. In these cases, the measured performance will be distorted because actual cost is subtracted from an incorrect measure of expected cost. For example, if cost-of-living is left out of the equation, the expected cost level for a low cost-of-living area will be too high and the expected cost level for a high cost area will be too low.

In order to gain confidence in the measurement of expected cost-to-serve, I have analyzed the coefficients which are estimated for the regression equations and I have prepared sensitivity analyses using alternative reasonable equations. If the statistical results conform with prior expectations in terms of the estimated coefficients and if a range of alternative equations produce similar results, the analysis can be described as "robust". In the analysis I describe below for distribution costs, bulk power costs, and administrative and other costs, I have found the measures of expected cost to be robust.

Q35. Describe the data which you use to obtain values for the explanatory variables.

(a) In performing the regression analysis to derive expected cost-to-serve, I use two general categories of data to measure the explanatory variables. The first category is data from FERC form 1's related to customer characteristics, load factors, depreciation rates and the age of plants. The second category of data includes variables which characterize the service territory of utility companies such as cost of living, population density and underground versus overhead lines which I have derived from various other sources. Each variable used in the regressions is described in Petitioner Exhibits ECB-5 through ECB-7.

The next three sections of my testimony describe regression equations and the explanatory variables which I use to measure IPL's performance for the categories of distribution cost, bulk power cost (transmission and generation) and administrative and other cost. My analysis demonstrates that IPL has achieved positive tangible value from realizing productivity which is better than most other electric utility companies in each of these areas. This implies that the state of efficiency of IPL's assets is higher than the relative state of efficiency for assets of other utility companies. After discussing IPL's performance for the separate cost categories I

describe IPL's aggregate performance.

VII. DISTRIBUTION COST-TO-SERVE

Q36. How do you define distribution cost-to-serve in your analysis of IPL's performance?

(a) Distribution costs include capital costs associated with investment in distribution equipment as well as salary and material expenses associated with operating and maintaining overhead and underground distribution lines, line transformers, station equipment and other property. Because there are tradeoffs between distribution operating and capital costs, costs associated with both the capital investment and the operating expense must be considered in analyzing the relative productivity of assets. Distribution cost-to-serve is defined using the formula:

Distribution Cost =
Distribution Expense + Distribution Depreciation Expense + (ROR x Net Distribution Plant).[14]

Q37. How does IPL's distribution cost-to-serve compare with other utility companies?

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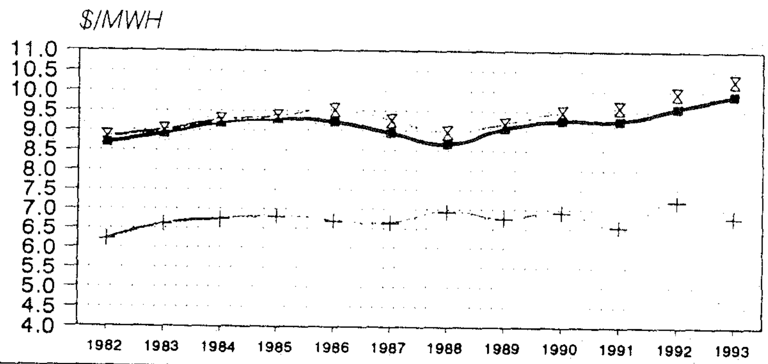
[14] ROR is the industry-average rate of return computed through dividing pre-tax net operating income by net plant as discussed above.

(a) IPL has consistently realized distribution cost-to-serve well below the national average. Figure 3 compares IPL distribution cost-to-serve per MWH from 1982 to 1993 with distribution cost-to-serve for the U.S. average (125 utility companies). The graph demonstrates that over the past eleven years, the national average of distribution costs range between 29% and 51% above IPL's costs.

Figure 3
Distribution Cost per MWH



	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
US AVERAGE	8.8	9.0	9.3	9.3	9.5	9.3	9.0	9.2	9.5	9.6	9.9	10.3
IPL	6.2	6.6	6.7	6.8	6.7	6.6	6.9	6.8	6.9	6.5	7.2	6.8
SIMILAR CITIES	8.7	8.9	9.2	9.3	9.2	8.9	8.7	9.1	9.3	9.2	9.6	9.9

US AVERAGE + IPL ■ SIMILAR CITIES

Figure 4 compares IPL's 1993 distribution cost-to-serve per MWH with the distribution cost-to-serve for individual utility companies serving similar sized cities as Indianapolis.

Figure 4
1993 Distribution Cost per MWH

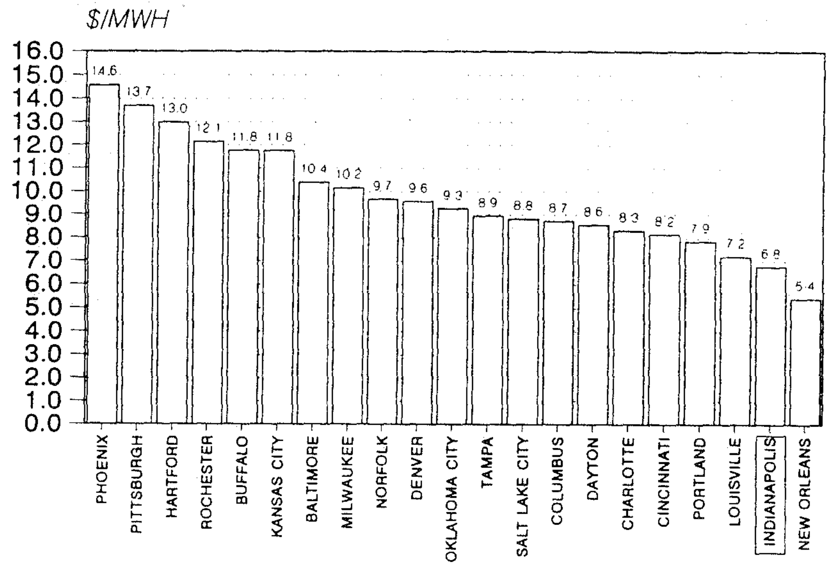


Figure 4 demonstrates that out of the 21 similar sized cities on the chart, only one utility company realized a lower distribution cost than IPL in 1993. Since the majority of distribution costs are represented by capital costs (72% for IPL), IPL's low cost-to-serve is primarily derived from its ability to efficiently construct and deploy assets. (Recall that the similar

sized city comparison is not used as the basis for measuring the productivity of IPL's assets, but rather for illustrative purposes.)

Q38. What factors other than management performance influence the level of distribution cost-to-serve?

(a) The level of distribution cost-to-serve per MWH experienced by an electric utility company is affected by many factors which are not related to performance. These factors are derived from the service territory of the company, the characteristics with which customers use electric energy, population density, and various other influences which cannot be controlled by management. Some of the influences which must be accounted for in comparing distribution costs among companies to evaluate performance include:

- <u>Regional Business Costs:</u> The level of distribution cost-to-serve is influenced by the regional business costs which exist in the service territory. The costs for operating, maintaining, and constructing distribution equipment reflect required wage levels and other business costs which in turn are influenced by costs of living in a regional area. Furthermore, there is wide disparity in living costs across the country. For example, the cost of housing in New York City is far higher than the cost of housing in St. Joseph, Missouri which means the cost of operating, maintaining and constructing distribution equipment should be substantially different for Consolidated Edison of New York than it is for St. Joseph Power &

Light, even if the two companies were equally proficient in managing their assets.

- Customer Usage Patterns: The level of distribution cost-to-serve per MWH is influenced by how customers use electricity over time. Customer characteristics are in turn dependent on the economic make-up of the service territory and the weather experienced in the region. Furthermore, since industrial customers generally require less investment in distribution equipment as compared with commercial and residential customers, a company with a high proportion of sales to industrial customers should experience relatively lower distribution costs. Finally, the level of usage per customer impacts distribution costs because costs associated with certain distribution equipment are a function of the number of customers rather than the usage of energy.

- Distribution cost-to-serve can be significantly influenced by the geography of a service territory. For example, in rural service territories, the level of investment in distribution lines per MWH of energy sold may be relatively high because of the longer distances of the distribution lines. On the other hand, in service territories where undergrounding is required because of very heavy density, distribution costs may be significantly greater than where overhead lines are allowed.

- Accounting conventions influence the measured level of distribution costs for individual utility companies. Since distribution cost-to-serve is defined using the level of net plant and book depreciation expense, the computed cost-to-serve is affected by the age of plant.[15] Furthermore, the depreciation rate can influence the cost-to-serve comparison between companies.

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[15] In modelling plant age I use the level of accumulated depreciation divided by net plant adjusted for impacts of alternative depreciation rates and the average cost of plant. These adjustments are necessary because of distortions which can arise from use of book costs.

- Various other factors influence distribution costs such as the size of the utility company (which allows realization of economies of scale).

Through adjusting for these service territory factors, my measures of relative asset productivity isolate IPL's performance after accounting for the nature of its service territory in Indianapolis. That is, measurement of the relative productivity of IPL's assets which I develop below exclude differences in cost which arise from the service territory related influences such as IPL's relatively densely populated service area and the moderate cost of living in Indianapolis.

Q39. Describe the regression equation you have developed to compute the expected level of distribution costs for individual electric utility companies.

(a) Petitioner's Exhibit ECB-5 shows details of the regression analysis which I have developed to quantify distribution cost performance. Line 1 lists the "dependent" variable of the regression (i.e. distribution cost-to-serve per MWH) and line 2 demonstrates that there are 1,500 data points used to estimate the equation. Lines 3 through 28 detail the coefficients of the explanatory variables which were estimated using the regression analysis. The first column displays the abbreviation for the independent variable for which the coefficient applies. The second column shows the value of the

coefficient in the equation and the third column shows the standard error of the coefficient which measures the dispersion of the estimated coefficient. The fourth column lists the t-statistic (the value of the coefficient divided by the standard error) which measures the reliability or the statistical significance of the coefficient. The final column shows the probability that the coefficient is insignificant.[16]

Petitioner's Exhibit ECB-5 demonstrates that the equation for distribution costs contain eleven explanatory economic variables representing factors that influence the level of cost-to-serve but which cannot directly be affected by managers of utility companies. These variables include the percentage of energy sales to residential customers, the relative cost of living in the service area, the residential use per customer, the number of distribution lines per kWh, the percentage of underground lines, the adjusted average age of distribution equipment, the distribution depreciation rate, the sales size, population density, and the yearly indicator variables.

Q40. Describe the explanatory variables which are used in the regression model of distribution costs.

[16] A probability of zero means that the coefficient is highly significant; a probability close to 1.0 means it is very unlikely that the coefficient is meaningful in the equation.

(a) Petitioner's Exhibit ECB-5 demonstrates that the regression is "robust". The variables shown in Exhibit 5 are statistically significant (i.e. there is more than a high probability that if the true coefficients are zero, the data relationships would not exist). Furthermore, the coefficients on each of the explanatory variables has the expected sign and/or magnitude (for example, the coefficient for the age variable is negative which suggests the higher the age the lower the expected cost). Petitioner's Exhibit ECB-5 also displays statistics which measure the overall ability of the regression to measure differences in cost-to-serve between companies.[17]

Q41. How do IPL's expected distribution costs compare to IPL's actual distribution costs?

(a) Figure 5 compares IPL expected distribution cost-to-serve with actual cost-to-serve over the eleven year period from 1982 to 1993. The graph demonstrates that IPL's actual cost has been below its expected cost in each year. The difference between expected and actual cost has ranged between $1.1/MWH and $1.8/MWH. This data demonstrates that the productivity of IPL's assets has been significantly better than the

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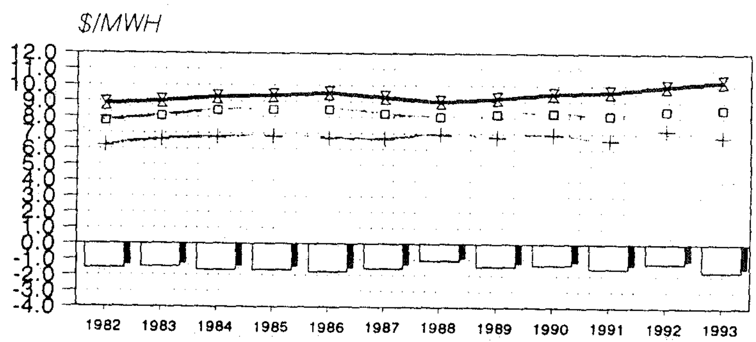
[17] The overall amount of distribution cost-to-serve variation between utilities which is "explained" by the regression equation does not include performance because no measure of performance is included as an explanatory variable.

productivity of distribution assets for the industry as a whole. Stated another way, IPL has realized 15-27% lower cost from distribution assets per kWh distributed than other electric utility companies. This means that the state of efficiency of IPL's assets are significantly better than the norm for the electric utility industry. IPL's productivity arises from efficiency in construction and deployment of assets as well as effective distribution operating practices.

Figure 5
IPL Distribution Cost Performance



	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
ACTUAL COST	6.2	6.6	6.7	6.8	6.7	6.6	6.9	6.8	6.9	6.5	7.2	6.8
EXPECTED COST	7.8	8.1	8.4	8.5	8.5	8.2	8.0	8.2	8.3	8.1	8.4	8.5
PERFORMANCE	-1.6	-1.5	-1.7	-1.7	-1.8	-1.6	-1.1	-1.4	-1.3	-1.6	-1.2	-1.8
US AVERAGE	8.8	9.0	9.3	9.3	9.5	9.3	9.0	9.2	9.5	9.6	9.9	10.3

+ ACTUAL COST ▫ EXPECTED COST □ PERFORMANCE ⧗ US AVERAGE

Q42. Describe the sensitivity analysis that you have developed with respect to modelling expected distribution cost.

(a) To assure that results from the distribution cost regression analysis are not overly dependent of specific explanatory variables, I have developed alternative regression models of expected distribution cost. These models vary from the "base case" model as follows:

Sensitivity 1: Exclude industrial sales and commercial sales mix as explanatory variables. These variables could potentially cause problems because of imprecision in reporting commercial and industrial energy sales among different companies.

Sensitivity 2: Include a measure of residential use per customer which adjusts for price elasticity impacts on use as an explanatory variable. This involves using a two step procedure which adjusts measured residential usage for impacts of differing prices.

Sensitivity 3: Include the age variable (accumulated depreciation divided by gross plant) without using a two stage procedure to adjust for depreciation rates and the gross value of assets.

Sensitivity 4: Exclude the sales size variable. This variable is included to account for economies of scale in operating distribution equipment.

As I discuss below, these sensitivity analyses verify the conclusions that the productivity IPL has obtained from its distribution assets is superior to the productivity of other electric utility companies.

Q43. How much value has IPL created from the relative productivity of its distribution assets?

(a) I compute the amount of value which IPL has created from distribution performance by multiplying the difference between actual and expected cost-to-serve by the level of retail sales. Table 6 shows the dollar value which IPL has created in terms of distribution cost performance on a year-by-year basis from 1982 to 1993. Column 1 lists the difference between actual and expected cost-to-serve on a dollar per MWH basis in the base case (the difference between the lines on figure 5). Column 2 shows the retail sales of IPL and column 3 displays the total value IPL has created by realizing lower than expected distribution cost-to-serve. The dollar value of performance in column 3 is calculated by multiplying the difference between expected and actual cost-to-serve per MWH (column 1) by the level of retail sales (column 2). The total dollar value created by IPL's performance over the eleven year period from 1982 to 1993 is $193 million which is an average annual amount of $16 million. Columns 4-7 show the dollar value of IPL's distribution performance for the three sensitivity cases in an analogous manner to the results for the base case shown in column 3.

TABLE 6
PERFORMANCE VALUE FOR DISTRIBUTION ASSETS

Year	IPL Difference Between Actual and Expected Cost-of -Service ($/MWH) (1)	IPL Retail Sales (MWH) (2)	Value Created By IPL Base Case ($000's) (3)	Dollar Performance Sensitivity Case 1 (4)	Dollar Performance Sensitivity Case 2 (5)	Dollar Performance Sensitivity Case 3 (6)	Dollar Performance Sensitivity Case 4 (7)
1982	$1.55	8,847,190	$13,716	$12,606	$17,579	$12,064	$13,511
1983	1.47	9,257,876	13,592	12,679	18,974	12,712	13,266
1984	1.68	9,667,987	16,216	15,202	22,403	15,223	15,846
1985	1.68	9,802,424	16,432	15,435	22,866	15,141	16,051
1986	1.79	10,300,898	18,428	17,481	26,033	16,308	17,970
1987	1.57	10,574,471	16,613	15,980	23,909	13,840	16,140
1988	1.08	11,162,941	12,001	11,440	20,326	9,151	11,424
1989	1.43	11,226,802	16,094	15,719	24,528	12,330	15,519
1990	1.33	11,370,699	15,139	14,923	24,173	9,439	14,577
1991	1.56	11,956,540	18,681	18,516	31,024	11,123	17,971
1992	1.22	11,752,441	14,367	14,496	25,583	6,160	13,726
1993	1.75	12,446,515	21,812	22,165	35,838	12,010	21,051
TOTAL	18.11	128,366,783	193,092	186,639	293,238	145,502	187,042
AVERAGE	$1.51	10,697,232	$16,091	$15,553	$24,436	$12,126	$15,587

Table 6 shows that under a wide range of sensitivity analyses, the results are consistent -- i.e. that IPL has created significant value because the productivity of its distribution assets is relatively higher than the productivity of distribution assets of other companies in the industry.

Q44. How would IPL's relative distribution performance be valued in an asset sale transaction?

(a) IPL has generated $193 million in value from its distribution cost performance compared to the industry norm without considering any value

from pre-1982 performance and without any recognition of the fact that cash flow generated from performance value would have allowed IPL's investors re-investment opportunities. In the discussion below, I address how the dollar amounts generated from IPL's relative productivity translate to tangible value.

In order to use the information from Table 6 to measure impacts on the tangible value of IPL's property, I quantify the incremental amount a willing buyer would pay for IPL's assets to reflect their relative productivity. I compute the value which new investors would attribute to IPL's performance over and above trended original cost. My approach assumes the productivity of IPL assets will decline on an annual basis and eventually become equal to the overall industry productivity. This means that my method does not attribute any value to IPL's obvious ability to continue generating value through performing more efficiently than other utility companies, and therefore it only considers existing performance.

Q45. Why do you not consider IPL's ability to continue outperforming the industry on an on-going basis in the calculation of tangible value?

(a) In computing the amount of value that investors would attribute to IPL's

relative productivity, I assume that the investors only gauge the historical value from relative productivity and do not attribute any value to IPL management's future ability to generate relative value on an on-going basis. To make this calculation, I assume that IPL's performance declines to the industry norm over the remaining life of the distribution assets.

I emphasize that there is no evidence from the historical data that IPL's value creation from distribution performance is diminishing (for example, the largest difference between actual and expected cost occurred in 1993). Rather, I make the assumption of declining performance to assure that, in computing tangible value, no consideration is made for on-going activities.

Q46. Describe how you compute the amount by which tangible value of IPL's distribution properties is understated from use of trended original cost.

(a) To determine the value which would be reflected in an asset sales transaction over and above trended original cost, I compute the net present value of cash flows which would be attributed to the relative state of efficiency of IPL's assets in a sales transaction. I compute the productivity increment to trended original cost by discounting the average annual performance amount of $16 million at the overall rate of return of

6.88% established by IPL witness Dr. Lewellen. I assume that the cash flow generated from productivity which is above the industry norm will decline on a straight line basis over time based on the remaining life of the property.

Capitalizing the $16 million at a 6.88% rate and assuming the value declines on a straight line basis over the 10 year remaining life of distribution property results in a dollar value of $100.2 million. If I had assumed that the performance is on-going rather than diminishing, the distribution component would have a value of $233.9 million. This means that by not attributing any value to IPL's ability to continue performing better than other utility companies on an on-going basis, only 43% of the value which has been demonstrated to exist in the past is included. The value calculations are shown on Petitioner's Exhibit ECB-8.

VIII. BULK POWER COST-TO-SERVE

Q47. How do you define bulk power cost-to-serve in your performance analysis?

(a) I define bulk power cost-to-serve as the sum of transmission costs and production cost-to-serve. Production cost includes the cost of constructing, operating and maintaining plants as well as the costs of fuel

and purchased power.[18] Transmission costs include costs of constructing, operating and maintaining overhead and underground lines, costs associated with substations and load dispatching costs.

I combine both transmission and production costs in evaluating the productivity of IPL's assets associated with bulk power because of tradeoffs which arise in managing transmission assets and production assets. For example, mine-mouth coal generating plants reduce the transportation component of fuel costs but increase transmission costs. Similarly, a strong transmission network may allow a company to increase sales for resale which reduces net production costs.

As is the case with distribution cost-to-serve, because tradeoffs exist between operating cost and capital costs, both are included in the cost-to-serve definition. Bulk power costs for each electric utility company are defined using the formula:

Bulk Power Cost =
Production Expense + Production Depreciation + (ROR x Net Production) - Sales for Resale Revenues + Transmission Expense + Transmission Depreciation + (ROR x Transmission Plant).

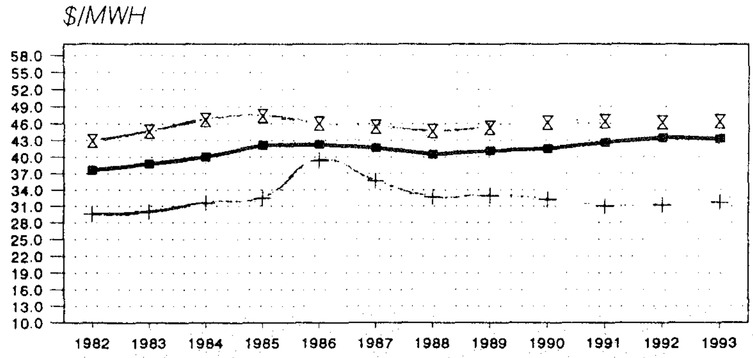
[18] In measuring production cost-of-service attributed to retail customers, I subtract revenues received from wholesale off-system sales and divide the cost net of sales for resale by retail kwh sales.

Q48. How does the level of IPL's bulk power costs compare with bulk power costs for other utilities?

(a) IPL has consistently realized bulk power cost-to-serve which is substantially below the average bulk power cost-to-serve of most other U.S. electric utility companies. Figure 6 shows bulk power cost-to-serve per MWH for IPL from 1982 to 1993 compared with the U.S. average bulk power cost-to-serve and demonstrates that the national average of bulk power costs have been from 17% and 49% above IPL's costs. (IPL's costs were somewhat higher in 1986 because of costs associated with Petersburg 4).

IPL's costs are below the industry because both production cost-to-serve per MWH <u>and</u> transmission cost-to-serve per MWH are lower than the national average. Furthermore, IPL's bulk power costs have declined significantly since 1986 in part because of its ability to achieve very economical fuel supply. Finally, there is no evidence that the difference between IPL's cost and other utility companies is diminishing.

Figure 6
Bulk Power Cost per MWH

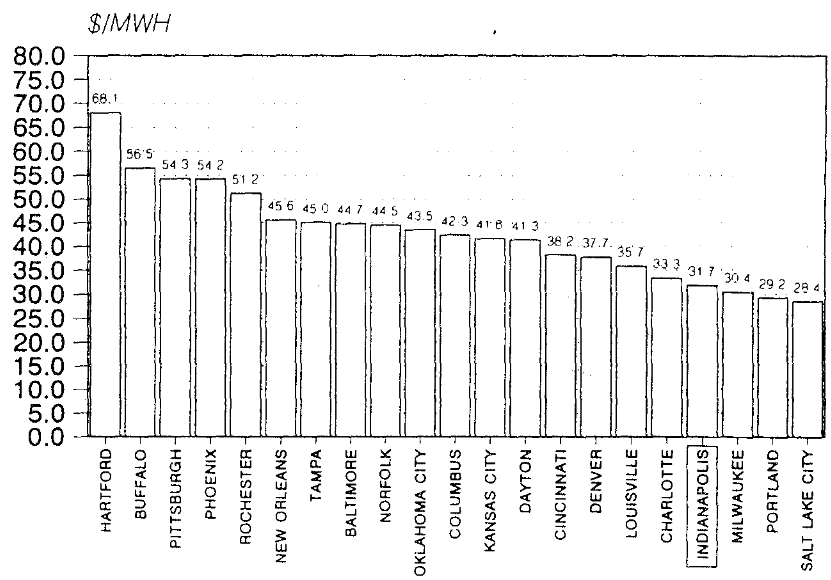


	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
US AVERAGE	42.9	44.6	46.7	47.4	46.0	45.4	44.7	45.3	46.2	46.4	46.3	46.4
IPL	29.6	30.0	31.6	32.5	39.3	35.6	32.7	32.9	32.2	31.0	31.2	31.7
SIMILAR CITIES	37.6	38.7	40.0	42.1	42.2	41.6	40.5	41.1	41.5	42.6	43.5	43.3

US AVERAGE + IPL ■ SIMILAR CITIES

Figure 7 illustrates 1993 bulk power cost-to-serve for IPL as compared with the bulk power cost-to-serve for each of the utilities serving similar sized cities as Indianapolis. (The similar city sample is presented for expository purposes; the quantification of value described below is based on the entire 125 utility database.)

Figure 7
1993 Bulk Power Cost per MWH



Q49. What factors other than performance in managing generation and transmission assets influence bulk power cost-to-serve?

(a) Bulk power cost-to-serve per kWh for IPL and other electric utility companies is influenced by a number of factors which are not related to management performance. In addition to many of the same factors which influence distribution cost such as regional cost-of-living and age of plant, the level of production costs incurred by a utility company can be significantly affected by differences in access to particular generating

sources. For example, low cost hydro power is not available to many utility companies because the ability to produce hydro electricity obviously depends on the location of rivers and the geography of the utility company's service area. Similarly, the price of natural gas should be less for a utility company located near areas which produce natural gas due to lower costs of transportation.

As is the case with distribution costs, the level of bulk power costs is influenced by the regional business costs which exist in the service territory and by the characteristics with which customers use electricity. For example, if energy usage is consistent over time, relatively less capacity is necessary to meet energy requirements of customers. Furthermore, since cost-to-serve is defined using the level of net plant and book depreciation expense, the level of measured bulk power cost-to-serve partially depends on the age of plant.

Q50. Describe the regression equation which you used to derive the expected bulk power cost-to-serve for each utility company.

(a) I have developed a regression equation to compute expected bulk power costs in a similar manner to the regression analysis which I discussed earlier for expected distribution costs. However, the bulk power cost

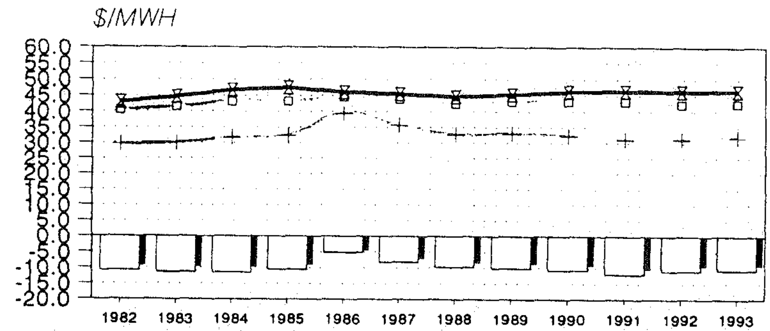
model is made up of separate equations for transmission cost and for generation cost. The equation which is used to compute expected bulk power cost-to-serve is shown on Petitioner's Exhibit ECB-6. The format of Petitioner's Exhibit ECB-6 is very similar to the format of Petitioner's Exhibit ECB-5 which I discussed earlier in the context of distribution cost-to-serve. Petitioner's Exhibit ECB-6 shows the regression analysis for transmission costs and Schedule 2 shows the regression analysis for production costs. The variables used in the regression equation for generation costs include hydro percentage, expected fuel and purchased power costs, regional cost of living, the depreciation rate, population of the largest city in the service territory, the seasonal difference between summer and winter peak, and the age of plant.

The coefficients of the variables included in the regression have the sign and magnitude which is expected (e.g. the sign for hydro percentage is negative implying that the more hydro the lower the costs). The overall amount of cost-to-serve variation between utility companies which is "explained" by the regression equation is 49% for production cost and 32% for transmission cost.

Q51. Describe IPL's performance in terms of managing bulk power cost-to-serve.

(a) Comparison of actual and expected bulk power cost-to-serve for IPL demonstrates that IPL has created a significant amount of value by realizing lower bulk power cost-to-serve than expected levels. IPL has achieved high productivity by realizing relatively lower costs than other companies in generating and transmitting bulk power. Figure 8 displays IPL expected bulk power cost-to-serve as compared with IPL's actual bulk power cost-to-serve. The graph demonstrates that expected bulk power cost-to-serve cost has exceeded actual bulk power cost-to-serve by between $5.1/MWH and $12.1/MWH.

Figure 8
IPL Bulk Power Cost Performance



	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
ACTUAL COST	29.6	30.0	31.6	32.5	39.3	35.6	32.7	32.9	32.2	31.0	31.2	31.7
EXPECTED COST	40.4	41.4	43.0	43.0	44.4	43.8	42.4	43.1	43.0	43.1	42.2	42.5
PERFORMANCE	-10.8	-11.5	-11.5	-10.6	-5.1	-8.2	-9.7	-10.2	-10.8	-12.1	-11.0	-10.8
US AVERAGE	42.9	44.6	46.7	47.4	46.0	45.4	44.7	45.3	46.2	46.4	46.3	46.4

+ ACTUAL COST ■ EXPECTED COST □ PERFORMANCE ⧖ US AVERAGE

Q52. Describe the sensitivity models which you have developed for bulk power cost-

to-serve.

(a) In addition to the model described in Petitioner's Exhibit ECB-6, I have examined alternative sensitivity models for bulk power cost. These sensitivity models include:

Sensitivity Case 1:	Include the percentage of nuclear power as an explanatory variable in measuring expected cost. Even though the decision to build nuclear power is a basic management decision, this variable is included in order to demonstrate that IPL's productivity does not arise simply because it did not build nuclear capacity.
Sensitivity Case 2:	Use the accumulated production depreciation divided by gross plant as the age variable without making adjustments for depreciation rates and capacity mix.
Sensitivity Case 3:	Remove expected fuel cost and expected purchased power cost from the regression equation. Although these variables are theoretically appropriate, since the variables are computed using a two stage regression process, I have included a sensitivity case to assure that the model results are not overly dependent on these two variables.
Sensitivity Case 4:	Exclude the variable which represents the size of the largest city in the service territory. This variable is included to account for difficulty in citing generating plants in large cities.
Sensitivity Case 5:	Exclude the sales size variable.

Q53. How much value has IPL crated by its bulk power performance?

(a) Table 7 demonstrates the dollar amount of value which has been generated by IPL derived from the relative productivity of its generation and transmission assets. The format of Table 7 is similar to the format of Table 6 which I discussed above for measuring value from distribution performance. The first column shows the difference between actual and expected bulk power cost-to-serve per MWH, the second column lists IPL retail sales, the third column demonstrates the total value created by IPL and the fourth through seventh columns show results for the sensitivity cases.

TABLE 7
PERFORMANCE VALUE FOR BULK POWER ASSETS

Year	IPL Difference Between Actual and Expected Cost-of -Service($/MWH) (1)	IPL Retail Sales (MWH) (2)	Value Created By IPL ($000's) (3)	Sensitivity Case 1 Value ($000's) (4)	Sensitivity Case 2 Value ($000's) (5)	Sensitivity Case 3 Value ($000's) (6)	Sensitivity Case 4 Value ($000's) (7)	Sensitivity Case 5 Value ($000's) (8)
1982	10.84	8,847,190	$95,905	$77,551	$81,404	$77,149	$114,561	$84,683
1983	11.46	9,257,875	106,141	86,748	90,530	86,500	125,812	94,894
1984	11.48	9,667.987	110,974	90,198	94,191	90,390	131,573	99,435
1985	10.57	9,802,424	103,631	79,809	86,075	82,711	124,943	92,144
1986	5.14	10,300,898	52,975	24,301	38,767	32,158	75,428	39,628
1987	8.19	10,574,471	86,563	56,008	70,848	65,194	107,674	73,247
1988	9.75	11,162,941	108,824	74,223	91,528	86,351	131,651	95,050
1989	10.20	11,226,802	114,498	81,755	96,135	91,709	140,056	100,075
1990	10.80	11,370,699	122,844	87,990	101,746	96,579	154,385	107,273
1991	12.10	11,956,540	144,670	107,608	123,768	120,282	177,642	129,720
1992	11.00	11,752,441	129,273	93,125	107,370	103,541	164,487	114,002
1993	10.78	12,446,515	134,215	96,403	112,606	107,639	174,037	118,439
TOTAL	122.32	128,366,783	1,310,513	955,719	1,094,968	1,040,204	1,622,248	1,148,690
Average	10.19	10,697,232	$109,209	$79,643	91,247	86,684	135,187	95,724

The fact that the data in columns 5 through 8 are similar to the information in column 3 shows that the regression equations are robust. Furthermore, the sensitivity case results shown in column 4 demonstrates that IPL's performance in terms of relative productivity does not arise simply because IPL does not have any nuclear plants. Column 4 shows that even when nuclear generation percentage is included as an explanatory variable, the average performance value is $80 million or 73% of the base case.

Q54. How should fair valuation of IPL's property be adjusted to reflect relative productivity of its bulk power assets?

(a) As was the case with the valuation distribution property, the trended original cost of IPL's generation and transmission assets understates their value because no consideration is made for the relative state of efficiency. Table 7 shows that the average value generated by IPL over the past twelve years from producing better than the industry norm for bulk power assets was $109 million per year. Management activities which generate this value include construction efficiency for generation and transmission assets, efficiency in obtaining fuel supply, efficiency in purchasing power and other activities related to the operation and maintenance of production and generation assets.

For purposes of computing the amount of value which would be realized in an asset sale transaction related to the differential productivity of bulk power assets, I capitalize the relative value in an analogous manner to the approach I described for distribution property. Using the 27 year remaining life of bulk assets over which time the performance value is presumed to decline to zero, the tangible value generated from relative bulk power productivity is $825.5 million. As was the case with distribution cost, this dollar figure assumes that IPL will not be able to

replace the efficiencies it has realized in the past but rather the relative cost-to-serve will diminish over time. If the assumption of declining value is not made, and performance is instead assumed to continue at historical levels, the value increment would be $1.6 billion.

IX. ADMINISTRATIVE AND OTHER COST-TO-SERVE

Q55. How do you define administrative and other cost-to-serve for purposes of evaluating IPL's relative productivity?

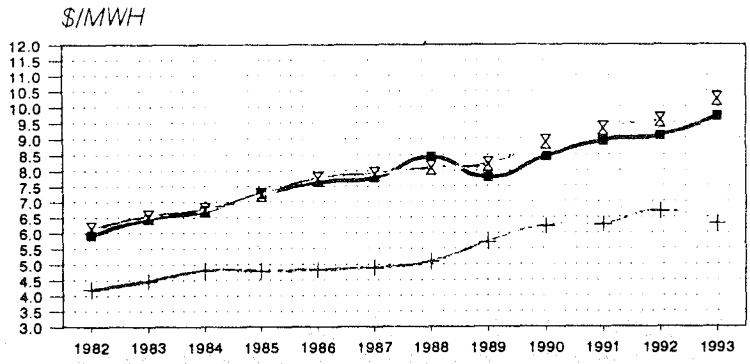
(a) The final category of cost-to-serve for which I analyze IPL's performance is administrative and other costs. These costs include all electric operating and maintenance costs and plant costs not measured in distribution costs and bulk power costs. In other words, this category includes all operating and maintenance expenses not included in the prior two categories. Administrative and other cost-to-serve includes expenses associated with customer accounts, customer service and informational expenses, sales expenses and other administrative and general expenses related to insurance, pensions, franchises and miscellaneous expenses. These costs are defined using the formula:

Administrative and Other Cost-to-Serve =
Customer Accounts, Customer Service, Sales and Administrative and General Expense + General Depreciation + (ROR x Net General Plant).

Q56. How do IPL's administrative and other costs compare with the costs experienced by other utilities?

(a) IPL has consistently realized administrative and other cost-to-serve which are significantly below the U.S. average and which are also significantly below the costs incurred by companies that serve similar sized cities as Indianapolis. Figure 9 shows IPL's administrative and other cost-to-serve per MWH for the period 1982 through 1992 compared with the U.S. average and compared with the average for the 20 electric utility companies which serve similar sized cities as Indianapolis. The graph demonstrates that the national average for administrative and other costs has consistently been 41% to 63% higher than IPL's cost.

Figure 9
Administrative and Other Cost per MWH

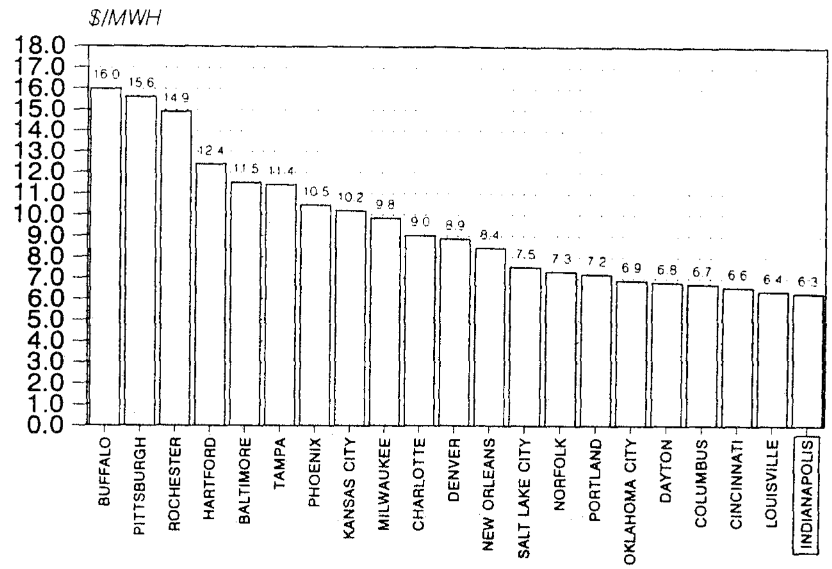


	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
US AVERAGE	6.1	6.5	6.7	7.2	7.7	7.9	8.1	8.2	8.9	9.3	9.6	10.2
IPL	4.2	4.5	4.8	4.8	4.8	4.9	5.1	5.7	6.2	6.3	6.7	6.3
SIMILAR CITIES	5.9	6.5	6.7	7.2	7.6	7.8	8.4	7.8	8.4	8.9	9.1	9.7

US AVERAGE   IPL   SIMILAR CITIES

Figure 10 illustrates 1993 administrative and other cost-to-serve for IPL compared with the cost-to-serve for utilities serving similar sized cities as Indianapolis on a utility by utility basis. The graph shows that IPL has realized lower administrative and other costs than all of the other utility companies which serve similar sized cities.

Figure 10
1993 Administrative and Other Cost per MWH



Q57. What factors influence the level of administrative and other costs for an electric utility company?

(a) The administrative and other cost-to-serve per MWH of an electric utility company is influenced by many factors which are not attributable to management performance. These factors are similar to the factors which influence distribution costs such as cost of living in the service territory, customer characteristics, residential use per customer and company size. The regression equation for administrative costs is the same as the

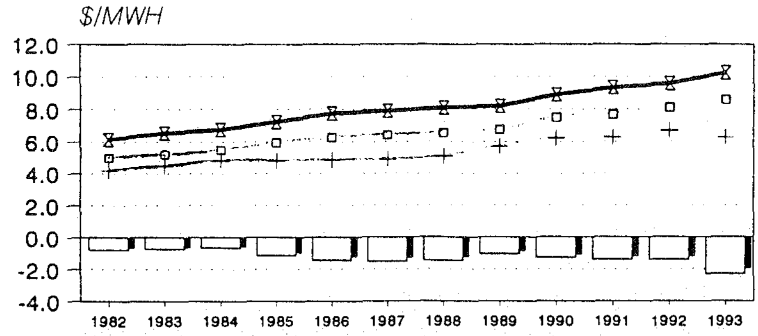
equation for distribution costs with the exception of variables representing underground percentage, quantity of distribution miles and population density. The regression results for administrative and other costs are shown on Petitioner's Exhibit ECB-7.

Q58. What is the performance of IPL in terms of expected and actual administrative cost-to-serve?

(a) As with the other cost components, the statistical analysis of administrative and other cost-to-serve establishes how much value IPL has created (or lost) by performing differently than other utilities. The expected cost per MWH is compared to actual cost per MWH and the difference between expected and actual cost is multiplied by the level of retail kWh sales to establish a dollar value of performance.

Figure 11 illustrates IPL's expected and actual administrative and other cost-to-serve for the period 1982 to 1993. The graph shows that IPL's actual cost-to-serve is between $.7/MWH and $2.3/MWH below IPL's expected cost.

Figure 11
IPL Administrative Cost Performance



	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
ACTUAL COST	4.2	4.5	4.8	4.8	4.8	4.9	5.1	5.7	6.2	6.3	6.7	6.3
EXPECTED COST	5.0	5.2	5.5	5.9	6.3	6.4	6.5	6.7	7.5	7.7	8.1	8.6
PERFORMANCE	-0.8	-0.7	-0.7	-1.1	-1.4	-1.5	-1.5	-1.0	-1.3	-1.4	-1.4	-2.3
US AVERAGE	6.1	6.5	6.7	7.2	7.7	7.9	8.1	8.2	8.9	9.3	9.6	10.2

+ ACTUAL COST ▫ EXPECTED COST □ PERFORMANCE ⧖ US AVERAGE

Q59. Describe the sensitivity analysis that you performed with respect to administrative costs.

(a) I performed a similar sensitivity analysis for administrative cost as I developed for distribution cost. The sensitivity analysis includes the following four cases:

Sensitivity 1: Exclude industrial sales and commercial sales mix variables. These variables could potentially cause problems because of imprecision in reporting

	commercial and industrial energy sales among different companies.
Sensitivity 2:	Include adjusted residential use as an explanatory variable using a two step procedure which adjusts measured residential usage for impacts of differing prices.
Sensitivity 3:	Exclude the sales size variable.

Q60. What has been the amount of value creation for IPL from managing administrative and other functions?

(a) Table 8 shows the dollar amount of value which IPL has created from realizing actual administrative and other cost-to-serve below the expected cost-to-serve. Table 8 has the same format as Table 7 and Table 6. This category of costs is less capital intensive than distribution cost or bulk power cost. Therefore, IPL's performance is derived from its ability to develop management systems which yield high productivity in terms of operating expenses.

TABLE 8
IPL VALUE CREATED BY ADMINISTRATIVE AND OTHER

Year	IPL Difference Between Actual and Expected Cost-of-Service ($/MWH) (1)	IPL Retail Sales (MWH) (2)	Value Created By IPL ($000's) (3)	Sensitivity Case 1 ($000's) (4)	Sensitivity Case 2 ($000's) (5)	Sensitivity Case 3 ($000's) (6)
1982	0.79	8,847,190	$6,982	$8,750	$7,957	$6,792
1983	0.73	9,257,875	6,776	8,536	9,174	6,426
1984	0.67	9,667,987	6,441	8,023	9,022	6,048
1985	1.15	9,802,424	11,253	12,897	13,752	10,921
1986	1.44	10,300,898	14,795	16,448	18,770	14,331
1987	1.53	10,574,471	16,136	18,346	19,491	15,713
1988	1.47	11,162,941	16,383	18,726	20,497	15,828
1989	1.05	11,226,802	11,764	14,530	14,450	11,370
1990	1.28	11,370,699	14,553	17,736	16,166	14,271
1991	1.41	11,956,540	16,799	20,373	21,256	16,061
1992	1.41	11,752,441	16,532	20,456	18,317	16,119
1993	2.31	12,446,515	28,754	33,084	32,287	28,071
TOTAL	15.21	128,366,783	167,167	197,903	201,140	161,950
AVERAGE	1.27	10,697,231	$13,931	16,492	16,762	13,496

As with sensitivity analyses for distribution and bulk power productivity, this analysis demonstrates that the statistical results are robust.

Q61. How much should IPL's trended original cost be incremented for its performance in terms of administrative and other costs?

(a) The average annual value IPL has generated in terms of administrative and other costs is $14 million per year. Furthermore, based on actual historical experience, there is no evidence that IPL's administrative performance is declining. I use a remaining life of 14 years based on the

remaining life of several plants which means that in 14 years time, IPL's productivity would decline to the industry norm. Using this data and the 6.88% discount rate, the capitalized value by which trended original cost understates value is $66.3 million. If the assumption was made that the performance would occur indefinitely, the value would be $202.5 million.

X. TOTAL COST-TO-SERVE

Q62. Describe IPL's performance in terms of total cost-to-serve.

(a) The total cost-to-serve can be computed for IPL and other electric utility companies in the database by summing distribution cost, bulk power cost and administrative cost. I make this total cost calculation for actual cost-to-serve per MWH, expected cost-to-serve per MWH, and performance per MWH. Figure 12 shows IPL's total cost-to-serve compared to the utilities in similar sized cities and Figure 13 shows the total cost-to-serve performance for IPL and the other utilities. I again emphasize that the quantification of value derived from relative performance is not based on the group of similar sized cities -- rather this group of utilities is a good sample for illustrated purposes to demonstrate how IPL compares with individual utility companies. Figure 13 demonstrates that IPL had a better overall performance than all of the utility companies serving similar sized

Total Cost-to-Serve for IPL and Similar Sized Metropolitan Areas

Figure 12
1993 Total Cost-to-Serve per MWH

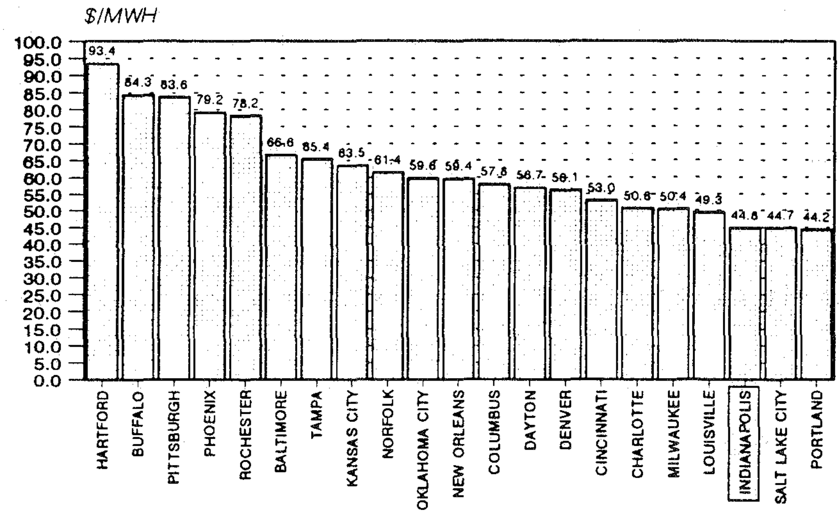
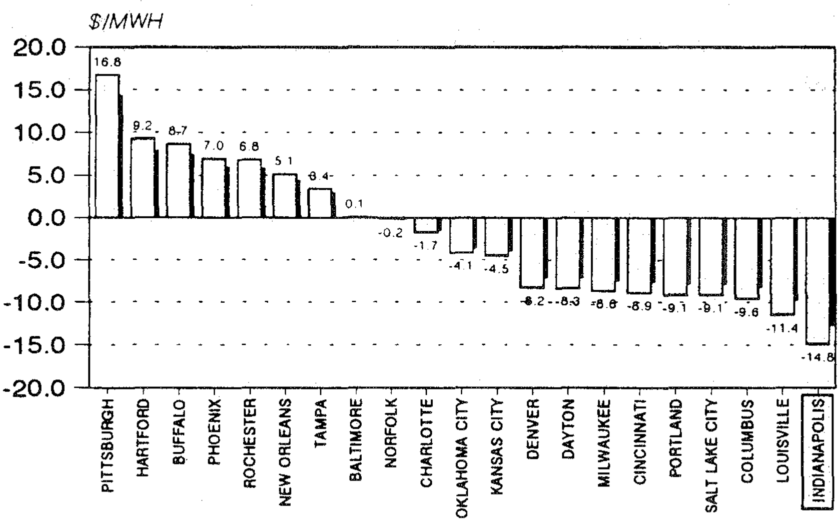


Figure 13
1993 Total Cost Performance per MWH



cities.

XI. COSTS RELATIVE TO INDEPENDENT POWER PRODUCERS

Q63. How is your analysis affected by comparing production costs of IPL to the cost of non-utility generators ("NUG's") instead of other electric utility companies?

(a) Over the last few years a significant amount of electric generating capacity has been constructed by NUG's rather than by investor-owned electric utility companies. Therefore, a legitimate issue related to my analysis of production costs is whether the relative performance analsyis of IPL should be limited to comparison with investor-owned utility companies, or whether costs incurred by non-utility generators should be included in gauging performance. For example, if the cost of non-utility generators is significantly below production costs for electric utility companies, an argument could be made that the value computations I have made above are biased because of an incomplete basis for comparing costs.

To investigate this issue, I have gathered information on the costs for NUGs compared to the cost realized by IPL and average cost-to-serve for

the electric the utility industry as a whole. I use information on contract costs between utility companies and non-utility generators compiled by UDI to make this comparison. The database includes information on 1,524 separate projects in 1991. Of these projects 609 include demand payments. Since the projects which do not include demand payments often do not provide capacity value, I have separately evaluated those projects which include demand payments. Furthermore, since contracts signed in California were often above cost and provided very high profits to NUG owners, I have analyzed the sample with and without the California projects.

Petitioner's Exhibit ECB-9 illustrates the results of this analysis. Line 1 of the exhibit shows the cost of power per MWH generated from NUG's from the entire database for 1991, line 2 shows the cost per MWH for the projects with demand payments and line 3 shows the projects excluding the California projects. Column 2 displays the number of projects in each category, column 3 shows the average cost per MWH produced, column 4 shows the weighted average (where weighting is done by the level of energy produced). Column 5 shows the cost including recognition of hidden leverage to account for the increased risk associated with NUG

contracts.[19] To make the data more comparable, line loss and reserve margin should be accounted for in the NUG cost since the production cost-to-serve figures I presented earlier are based on retail sales and are higher than data which would result from comparing costs with energy output. These factors would also serve to increase the cost of NUG power.

The data on Petitioner's Exhibit ECB-9 shows that the NUG costs are significantly greater than production cost of $42.3/MWH for the electric utility industry and are orders of magnitude greater than IPL's production cost of $29.6/MWH.

XII. COMPARISON OF PERFORMANCE COMPONENT OF FAIR VALUE RATE BASE WITH INCENTIVE MECHANISMS

Q64. Is inclusion of a performance component in rate base the same as an incentive mechanism?

(a) No. In a market economy, firms which have performed well relative to others in an industry are rewarded through increases in asset value.

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[19] It is important to consider "hidden leverage" in this analysis because contracts between NUGs and "host" utility companies often require fixed payments. Issues involving hidden leverage are explained by IPL witness Nathan Partain. The fixed payments are functionally equivalent to debt and the costs of NUG power must reflect the incremental risk.

Performance is a function of many things including the type and amounts of investments, the efficiency in managing costs, marketing and developing new products. Receiving value for performance is an obvious and crucial way that a crucial resource - management talent - is allocated efficiently in the economy (i.e. good performance is rewarded).

I emphasize that in no way does inclusion of a performance component of fair value rate base equate to an incentive mechanism to operate efficiently in the future. The techniques which I have discussed in my testimony to include a performance component in fair value rate base purely relate to the relationship between measured value and historical performance. Incentive mechanisms on the other hand generally involve targets for future performance, and are often designed to counter, at least in part, some of the disincentives to efficient performance associated with cost-plus, original cost rate making.

Q65. Does this conclude your direct testimony?

(a) Yes.

UDI Utility Data Institute

FOR IMMEDIATE RELEASE

PACIFIC NW UTILITIES TOP LOW COST POWER PRODUCERS

WASHINGTON, DC, March 2, 1994 -- Five electric utilities in the Pacific Northwest produced and/or purchased electricity at the least-cost in the five-year period 1988-1992, according to a new 10-year analysis of investor-owned electric utility performance by the Utility Data Institute (UDI).

UDI's analysis considers operations, maintenance and fuel expenses at each company's generating plant(s) in addition to expenses for wholesale power purchased from other utilities and non-utility generators. The rankings of 143 investor-owned utilities are heavily influenced by the type of fuel used to produce electricity and the amount of energy purchased from other companies (utilities and non-utility generators).

"The utilities in the Pacific Northwest rely more on hydroelectric power which has no fuel cost, and less on coal and nuclear power," explained Liz Hannon, UDI President. "Other utilities that rely primarily on oil and natural gas with large transportation costs or utilities which purchase most of their power from other suppliers have higher costs."

UDI's report ranked Washington Water Power Co., Spokane, WA, first with a five-year average cost/megawatthour (MWhr) of electricity of $11.57; Idaho Power Co., Boise, ID, second at $12.27/Mwhr; Pacific Power & Light Co. (Pacificorp), Portland, OR,

MORE

EXECUTIVE SUMMARY 1

SELECTED INVESTOR-OWNED UTILITIES RANKED BY AVG $/MWHR 1988:1992 (1)

5-Yr Rank	Average $/MWhr	Utility	Tot Pwr Prod ($) 1988:92	Tot Energy (2) (MWhrs) 1988:92	$/MWhr 83-87
1	11.57	WASHINGTON WATER POWER CO	617,542,841	53,376,189	9.33
2	12.27	IDAHO POWER CO	864,847,834	70,485,941	7.30
3	14.73	PACIFIC POWER & LIGHT CO	3,693,284,983	250,704,591	12.38
4	14.78	PUGET SOUND POWER & LIGHT	1,493,973,522	101,050,981	11.71
5	14.86	PORTLAND GENERAL ELEC CO	1,468,076,729	98,802,225	10.33
6	15.12	OTTER TAIL POWER CO	315,864,601	20,885,441	15.08
7	15.64	NORTHWESTERN PUBLIC SERV	82,818,793	5,294,504	21.66
8	15.78	MONTANA POWER CO	894,471,249	56,690,619	10.82
9	16.45	INDIANAPOLIS POWER & LT	1,025,319,764	62,336,756	17.42
10	16.73	KENTUCKY UTILITIES CO	1,249,260,709	74,693,918	20.50
11	17.26	EMPIRE DISTRICT ELEC CO	305,915,625	17,722,614	18.05
12	17.38	IOWA SOUTHERN UTILITIES	219,974,900	12,660,156	15.16
13	17.71	ST JOSEPH LIGHT & POWER	134,162,660	7,577,363	17.55
14	17.92	LOUISVILLE GAS & ELEC CO	1,018,743,987	56,846,425	20.39
15	18.37	KANSAS CITY POWER & LIGHT	1,126,038,315	61,289,142	19.44
16	18.76	MINNESOTA POWER & LIGHT	978,005,942	52,131,363	19.00
17	18.79	WESTERN RESOURCES-KP&L	934,091,640	49,720,142	20.57
18	19.20	UNION ELECTRIC CO	3,337,403,594	173,865,126	18.47
19	19.34	IOWA-ILLINOIS GAS & ELEC	546,924,389	28,273,338	16.58
20	19.50	MONTANA-DAKOTA UTILITIES	230,073,277	11,799,540	20.21
21	19.65	WISCONSIN POWER & LIGHT	1,004,001,222	51,093,538	19.96
22	19.65	WISCONSIN ELEC POWER CO	2,531,824,067	128,825,907	21.52
23	19.97	CINCINNATI GAS & ELEC CO	2,154,192,465	107,868,920	22.49
24	20.07	PSI ENERGY INC	2,456,053,222	122,367,796	18.07
25	20.12	OHIO POWER CO	4,177,586,589	207,679,859	18.06
26	20.18	APPALACHIAN POWER CO	3,547,022,611	175,777,639	21.10
27	20.26	DAYTON POWER & LIGHT CO	1,450,261,641	71,599,093	22.12
28	20.55	MISSISSIPPI POWER CO	1,050,293,422	51,099,991	26.21
29	20.61	SOUTHWESTERN PUB SERV CO	1,988,589,598	96,483,264	25.87
30	20.65	INTERSTATE POWER CO	503,921,006	24,408,420	21.19
31	21.01	SOUTH CAROLINA ELEC & GAS	1,685,886,871	80,226,739	22.68
32	21.05	CENTRAL LOUISIANA ELEC CO	646,245,181	30,695,258	29.98
33	21.09	SOUTHWESTERN ELEC PWR CO	1,787,254,246	84,732,979	23.24
34	21.18	SOUTHERN INDIANA GAS ELEC	600,018,000	28,323,288	21.17
35	21.29	KENTUCKY POWER CO	869,593,912	40,845,041	23.80
36	21.44	NORTHERN STATES POWER MN	3,512,819,827	163,819,006	20.45
37	21.58	KANSAS GAS & ELECTRIC CO	1,000,774,949	46,381,772	22.36
38	21.74	NEW YORK STATE ELEC & GAS	2,112,809,482	97,163,395	21.57

(1) Only utilities filing all applicable Form 1 schedules for all five years and those not acting primarily as wholesalers have been included.
(2) Power Production Expenses ($) and Energy (MWhrs) include purchased power and power for internal use.

UDI-2028-94

third, at $14.73/Mwhr; Puget Sound Power & Light, Seattle, WA, fourth at $14.78/MWhr; and Portland General Electric Co., Portland, OR, fifth, at $14.86/MWhr.

Other five-year low-cost producers in the "Top 10" are: 6) Otter Tail Power Co., Fergus Falls, MN, at $15.12/MWhr; 7) Northwestern Public Service, Huron, SD, at $15.64/MWhr; 8) Montana Power Co., Butte, MT, at $15.78/MWhr; 9) Indianapolis Power & Light Co., Indianapolis, IN, at $16.45/MWhr; and 10) Kentucky Utilities, Lexington, KY, at $16.73/MWhr.

Apart from the fact that fossil fuel prices, in general, declined over the five-year period, the most notable feature in UDI's analysis of investor-owned utilities is the 10-year change in the percentage of purchased power versus power generated by a company's own plants. In 1983, only $15 of every $100 spent for electric operations and maintenance company-wide was for power purchases and $64 for power production. By 1992, $27 of every $100 was spent for purchased power and $49 for power production, according to UDI's report.

The report and data diskette are available for purchase from UDI at 1-202-942-8788 or 1-800-486-3660. UDI is a directory and data base publishing unit of McGraw-Hill, Inc., and has provided source data to the electric power industry for fourteen years.

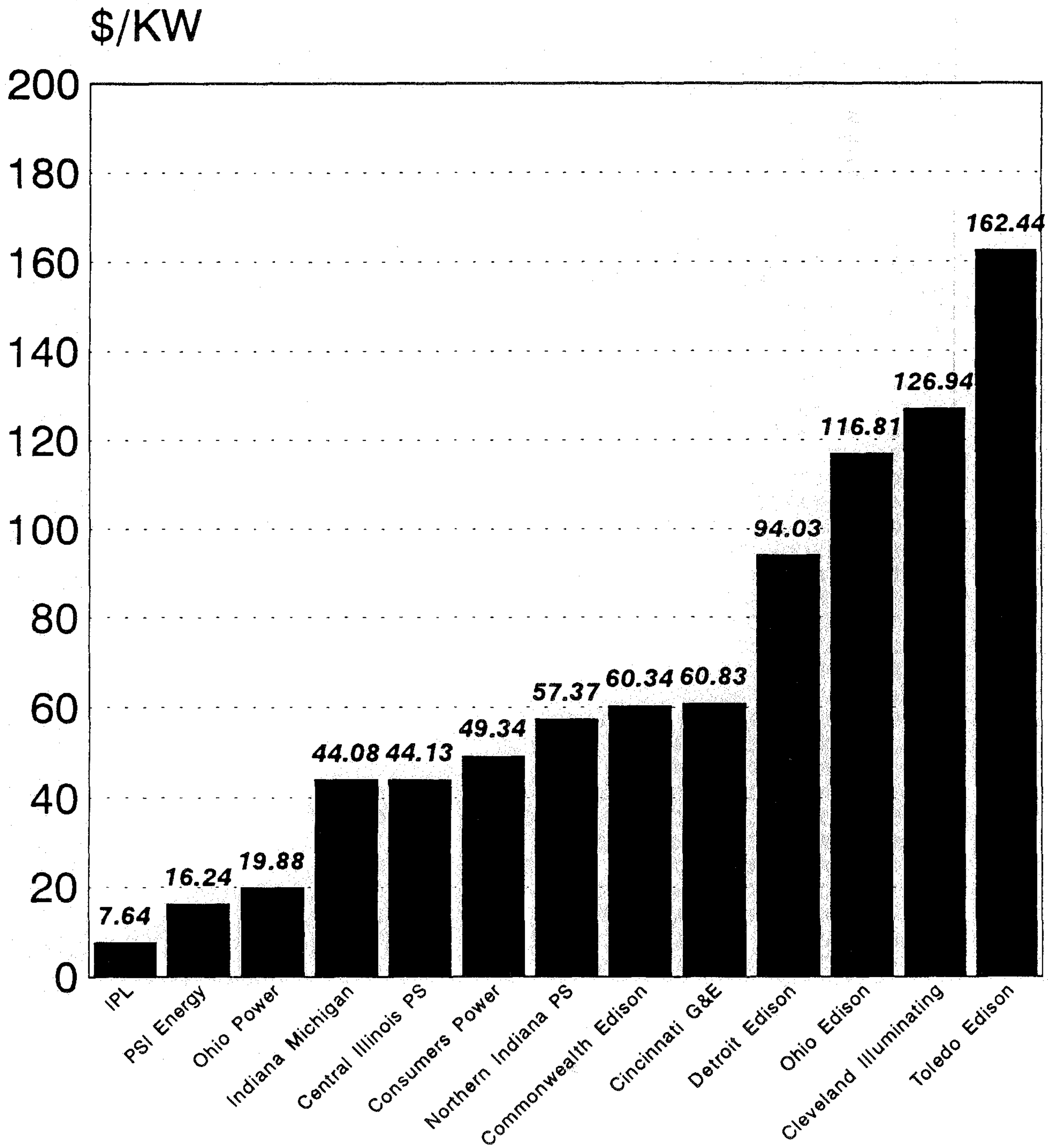
END

Attachment:
Executive Summary 1 from report

U. S. INVESTOR-OWNED UTILITY COMPANIES IN COST-OF-SERVICE DATABASE

Line No.	Code	Utility Company	City	State	Line No.
1	ACE	ATLANTIC CITY ELECTRIC CO	PLEASANTVILLE	NJ	1
2	ALP	ALABAMA POWER CO	BIRMINGHAM	AL	2
3	APC	APPALACHIAN POWER CO	ROANOKE	VA	3
4	APL	ARKANSAS POWER & LIGHT CO	LITTLE ROCK	AR	4
5	APS	ARIZONA PUBLIC SERVICE CO	PHOENIX	AZ	5
6	BEC	BOSTON EDISON CO	BOSTON	MA	6
7	BGE	BALTIMORE GAS & ELEC CO	BALTIMORE	MD	7
8	BHP	BLACK HILLS POWER & LIGHT	RAPID CITY	SD	8
9	BVE	BLACKSTONE VALLEY ELEC	LINCOLN	RI	9
10	CAM	CAMBRIDGE ELEC LIGHT CO	CAMBRIDGE	MA	10
11	CAR	CAROLINA POWER & LIGHT CO	RALEIGH	NC	11
12	CEC	CONSOLIDATED EDISON CO	NEW YORK	NY	12
13	CEI	CLEVELAND ELEC ILLUM CO	CLEVELAND	OH	13
14	CGE	CINCINNATI GAS & ELEC CO	CINCINNATI	OH	14
15	CHG	CENTRAL HUDSON GAS & ELEC	POUGHKEEPSIE	NY	15
16	CIL	CENTRAL ILLINOIS LIGHT CO	PEORIA	IL	16
17	CIP	CENT ILLINOIS PUBLIC SERV	SPRINGFIELD	IL	17
18	CLE	CENTRAL LOUISIANA ELEC CO	PINEVILLE	LA	18
19	CLP	CONNECTICUT LIGHT & POWER	HARTFORD	CT	19
20	CMP	CENTRAL MAINE POWER CO	AUGUSTA	ME	20
21	COM	COMMONWEALTH ELECTRIC CO	CAMBRIDGE	MA	21
22	CPC	CONSUMERS POWER CO	JACKSON	MI	22
23	CPL	CENTRAL POWER & LIGHT CO	CORPUS CHRISTI	TX	23
24	CSO	COLUMBUS SOUTHERN POWER	COLUMBUS	OH	24
25	CVP	CENTRAL VERMONT PUB SERV	RUTLAND	VT	25
26	CWE	COMMONWEALTH EDISON CO	CHICAGO	IL	26
27	DAY	DAYTON POWER & LIGHT CO	DAYTON	OH	27
28	DEC	DETROIT EDISON CO	DETROIT	MI	28
29	DLC	DUQUESNE LIGHT CO	PITTSBURGH	PA	29
30	DMP	DELMARVA POWER & LIGHT CO	WILMINGTON	DE	30
31	DPC	DUKE POWER CO	CHARLOTTE	NC	31
32	EDS	EMPIRE DISTRICT ELEC CO	JOPLIN	MO	32
33	EEC	EASTERN EDISON CO	BROCKTON	MA	33
34	EPE	EL PASO ELECTRIC CO	EL PASO	TX	34
35	FGE	FITCHBURG GAS & ELEC CO	FITCHBURG	MA	35
36	FPC	FLORIDA POWER CORP	ST. PETERSBURG	FL	36
37	FPL	FLORIDA POWER & LIGHT CO	JUNO BEACH	FL	37
38	GAP	GEORGIA POWER CO	ATLANTA	GA	38
39	GMP	GREEN MOUNTAIN POWER CORP	SOUTH BURLINGTON	VT	39
40	GPC	GULF POWER CO	PENSACOLA	FL	40
41	GSU	GULF STATES UTILITIES	BEAUMONT	TX	41
42	HEC	HAWAIIAN ELECTRIC CO	HONOLULU	HI	42
43	HLP	HOUSTON LIGHTING & POWER	HOUSTON	TX	43
44	IDP	IDAHO POWER CO	BOISE	ID	44
45	IEL	IOWA ELEC LIGHT & POWER	CEDAR RAPIDS	IA	45
46	IIG	IOWA-ILLINOIS GAS & ELEC	DAVENPORT	IA	46
47	ILP	ILLINOIS POWER CO	DECATUR	IL	47
48	IME	INDIANA MICHIGAN POWER CO	FORT WAYNE	IN	48
49	IPC	INTERSTATE POWER CO	DUBUQUE	IA	49
50	IPL	INDIANAPOLIS POWER & LT	INDIANAPOLIS	IN	50
51	ISU	IOWA SOUTHERN UTILITIES	CENTERVILLE	IA	51

Moody's Electric Generating Cost Analysis
Break Even Prices in the "Michigan Competitive Arena"



U. S. INVESTOR-OWNED UTILITY COMPANIES IN COST-OF-SERVICE DATABASE

Line No.	Code	Utility Company	City	State	Line No.
103	SEP	SAVANNAH ELEC & POWER CO	SAVANNAH	GA	103
104	SIG	SOUTHERN INDIANA GAS ELEC	EVANSVILLE	IN	104
105	SJL	ST JOSEPH LIGHT & POWER	ST. JOSEPH	MO	105
106	SPP	SIERRA PACIFIC POWER CO	RENO	NV	106
107	SPS	SOUTHWESTERN PUB SERV CO	AMARILLO	TX	107
108	SWE	SOUTHWESTERN ELEC PWR CO	SHREVEPORT	LA	108
109	TEC	TAMPA ELECTRIC CO	TAMPA	FL	109
110	TEP	TUCSON ELECTRIC POWER CO	TUCSON	AZ	110
111	TNM	TEXAS-NEW MEXICO POWER CO	FORT WORTH	TX	111
112	TOE	TOLEDO EDISON CO	TOLEDO	OH	112
113	TUE	TEXAS UTILITIES ELEC CO	DALLAS	TX	113
114	UEC	UNION ELECTRIC CO	ST. LOUIS	MO	114
115	UIC	UNITED ILLUMINATING CO	NEW HAVEN	CT	115
116	UUI	UTILICORP UNITED INC	KANSAS CITY	MO	116
117	VEP	VIRGINIA ELEC & POWER CO	RICHMOND	VA	117
118	WEP	WEST PENN POWER CO	GREENSBURG	PA	118
119	WIE	WISCONSIN ELEC POWER CO	MILWAUKEE	WI	119
120	WME	WESTERN MASS ELEC CO	WEST SPRINGFIELD	MA	120
121	WPL	WISCONSIN POWER & LIGHT	MADISON	WI	121
122	WPS	WISCONSIN PUBLIC SERVICE	GREEN BAY	WI	122
123	WRS	WESTERN RESOURCES-KP&L	TOPEKA	KS	123
124	WTU	WEST TEXAS UTIL CO	ABILENE	TX	124
125	WWP	WASHINGTON WATER POWER CO	SPOKANE	WA	125

Petitioner's Exhibit ECB-2
IURC Cause No. 39938

U. S. INVESTOR-OWNED UTILITY COMPANIES IN COST-OF-SERVICE DATABASE

Line No.	Code	Utility Company	City	State	Line No.
52	JCP	JERSEY CENT POWER & LIGHT	MORRISTOWN	NJ	52
53	KCP	KANSAS CITY POWER & LIGHT	KANSAS CITY	MO	53
54	KGE	KANSAS GAS & ELECTRIC CO	WICHITA	KS	54
55	KPC	KENTUCKY POWER CO	ASHLAND	KY	55
56	KUC	KENTUCKY UTILITIES CO	LEXINGTON	KY	56
57	LGE	LOUISVILLE GAS & ELEC CO	LOUISVILLE	KY	57
58	LIL	LONG ISLAND LIGHTING CO	HICKSVILLE	NY	58
59	LPL	LOUISIANA POWER & LIGHT	NEW ORLEANS	LA	59
60	MDU	MONTANA-DAKOTA UTILITIES	BISMARCK	ND	60
61	MEC	MASSACHUSETTS ELEC CO	WESTBOROUGH	MA	61
62	MED	METROPOLITAN EDISON CO	MUHLENBURG TWP	PA	62
63	MGE	MADISON GAS & ELEC CO	MADISON	WI	63
64	MIP	MINNESOTA POWER & LIGHT	DULUTH	MN	64
65	MOP	MONTANA POWER CO	BUTTE	MT	65
66	MPC	MONONGAHELA POWER CO	FAIRMOUNT	WV	66
67	MPL	MISSISSIPPI POWER & LIGHT	JACKSON	MS	67
68	MPS	MAINE PUBLIC SERVICE CO	PRESQUE ISLE	ME	68
69	MSP	MISSISSIPPI POWER CO	GULFPORT	MS	69
70	NEC	NARRAGANSETT ELECTRIC CO	PROVIDENCE	RI	70
71	NIP	NO INDIANA PUBLIC SERVICE	HAMMOND	IN	71
72	NMP	NIAGARA MOHAWK POWER CORP	SYRACUSE	NY	72
73	NPC	NEVADA POWER CO	LAS VEGAS	NV	73
74	NPS	NEW ORLEANS PUBLIC SERV	NEW ORLEANS	LA	74
75	NSP	NORTHERN STATES POWER MN	MINNEAPOLIS	MN	75
76	NWP	NORTHWESTERN PUBLIC SERV	HURON	SD	76
77	NYS	NEW YORK STATE ELEC & GAS	ITHACA	NY	77
78	OED	OHIO EDISON CO	AKRON	OH	78
79	OGE	OKLAHOMA GAS & ELEC CO	OKLAHOMA CITY	OK	79
80	OPC	OHIO POWER CO	CANTON	OH	80
81	ORU	ORANGE & ROCKLAND UTIL	PEARL RIVER	NY	81
82	OTP	OTTER TAIL POWER CO	FERGUS FALLS	MN	82
83	PEC	PENNSYLVANIA ELEC CO	JOHNSTOWN	PA	83
84	PEP	PENNSYLVANIA POWER & LT	ALLENTOWN	PA	84
85	PGE	PACIFIC GAS & ELEC CO	SAN FRANCISCO	CA	85
86	PHE	PHILADELPHIA ELECTRIC CO	PHILADELPHIA	PA	86
87	PNH	PUBLIC SERV NEW HAMPSHIRE	MANCHESTER	NH	87
88	POE	POTOMAC EDISON CO	HAGERSTOWN	MD	88
89	POG	PORTLAND GENERAL ELEC CO	PORTLAND	OR	89
90	POP	POTOMAC ELECTRIC POWER CO	WASHINGTON	DC	90
91	PPC	PENNSYLVANIA POWER CO	NEW CASTLE	PA	91
92	PPL	PACIFIC POWER & LIGHT CO	PORTLAND	OR	92
93	PSC	PUBLIC SERVICE COLORADO	DENVER	CO	93
94	PSE	PUBLIC SERVICE ELEC & GAS	NEWARK	NJ	94
95	PSI	PSI ENERGY INC	PLAINFIELD	IN	95
96	PSN	PUBLIC SERVICE NEW MEXICO	ALBUQUERQUE	NM	96
97	PSO	PUBLIC SERVICE OKLAHOMA	TULSA	OK	97
98	PSP	PUGET SOUND POWER & LIGHT	BELLEVUE	WA	98
99	RGE	ROCHESTER GAS & ELEC CORP	ROCHESTER	NY	99
100	SCE	SOUTHERN CALIF EDISON CO	ROSEMEAD	CA	100
101	SDG	SAN DIEGO GAS & ELEC CO	SAN DIEGO	CA	101
102	SEG	SOUTH CAROLINA ELEC & GAS	COLUMBIA	SC	102

INDIANAPOLIS POWER & LIGHT 1993 COST-TO-SERVE
($000)

Line No.		Production	Distribution	Transmission	Administrative and Other	Total	Total[1] Per MWH	Line No.
1	NET PLANT	$905,057	$282,421	$129,746	$ 79,331	$1,396,555		1
2	NET PLANT X ROR[2]	107,002	33,390	15,340	9,379	165,111	13.27	2
3	OPERATION AND MAINTENANCE EXPENSE	230,620	23,719	5,620	64,562	324,521	26.07	3
4	LESS: SALES/RESALE	(6,134)				(6,134)	(0.49)	4
5	DEPRECIATION EXPENSE	37,253	27,320	5,115	4,279	73,967	5.94	5
6	TOTAL COST-OF-SERVICE	368,741	84,429	26,075	78,220	557,465	$44.79	6
7	COST-OF-SERVICE PER KWH	$29.63	$6.78	$2.09	$6.28		$44.79	7
8	IPL ROR VS. INDUSTRY-WIDE ROR X NET PLANT[3]					42,717	3.43	8
9	NET OTHER[4]					(20,246)	(1.63)	9
10	STATE AND LOCAL TAXES[5]					35,884	2.88	10
11	COST-OF-SERVICE INCLUDING STATE AND LOCAL TAXES AND RETURN ADJUSTMENTS					$615,820	$49.48	11
12	RETAIL REVENUES/RETAIL RATES					$615,820	$49.48	12

[1] Retail sales for use in this calculation is 12,446,515 MWH.

[2] ROR is computed by dividing pre-federal income tax operating income by net plant and averaging across all companies. For the industry, the ROR was 11.823% in 1993.

[3] ROR difference is 14.882% - 11.823% multiplied by net plant of $1,396,555.

[4] Includes other revenues of $7,372 plus net regulatory credits of $14,439 less amortization of $1,557.

[5] Includes non-income taxes of $28,129 and non-federal income taxes of $7,756.

UTILITY COMPANIES SERVING SIMILAR SIZED CITIES AS INDIANAPOLIS

Line No.	Metropolitan Area	Population	Rank	Utility Company	Investor-Owned	Line No.
1	Baltimore, MD	2,382,172	18	Baltimore Gas and Electric Company	YES	1
2	Pittsburgh, PA	2,056,705	19	Duquesne Light Company	YES	2
3	Phoenix, AZ	2,122,101	20	Arizona Public Service Company	YES	3
4	Tampa, FL	2,067,959	21	Tampa Electric Company	YES	4
5	Cincinnati-Hamilton, OK-KY-IN	1,744,124	23	Cincinnati Gas and Electric Company	YES	5
6	Denver, CO	1,622,980	22	Public Service Colorado	YES	6
7	Milwaukee, WI	1,432,149	24	Wisconsin Electric Power Company	YES	7
8	Kansas City, KS-MO	1,566,280	25	Kansas City Power and Light Company	YES	8
9	Sacramento, CA	1,481,102	26	Sacramento Municipal District	NO	9
10	Portland, OR	1,239,842	27	Portland General Electric Company	YES	10
11	Norfolk-Virginia Beach-Newport News, VA	1,396,107	28	Virginia Electric Power Company	YES	11
12	Columbus, OH	1,377,419	29	Columbus and Southern Power Company	YES	12
13	San Antonio, TX	1,302,099	30	San Antonio Public Service Board	NO	13
14	Indianapolis, IN	1,249,822	31	Indianapolis Power and Light Company	YES	14
15	New Orleans, LA	1,238,816	32	New Orleans Public Service Company	YES	15
16	Buffalo-Niagara Falls, NY	1,189,288	33	Niagara Mohawk Power Corporation	YES	16
17	Charlotte-Gastonia-Rock Hill, NC-SC	1,162,093	34	Duke Power Company	YES	17
18	Hartford-New Britian, CT	1,123,678	35	Connecticut Light and Power Company	YES	18
19	Orlando, FL	1,072,748	36	Orlando Utilities Commission	NO	19
20	Salt Lake City, UT	1,072,227	37	Pacific Power and Light Company	YES	20
21	Rochester, NY	1,002,410	38	Rochester Gas and Electric Company	YES	21
22	Nashville, TN	985,026	39	Nashville Electric Service	NO	22
23	Memphis, TN	981,747	40	Memphis Light, Gas and Water	NO	23
24	Oklahoma City, OK	958,839	41	Oklahoma Gas and Electric Company	YES	24
25	Louisville, KY	952,662	42	Louisville Gas and Electric Company	YES	25
26	Dayton, OH	951,270	43	Dayton Power and Light Company	YES	26

SOURCE: State And Metropolitan Area Database From 1990 Census

Petitioner's Exhibit ECB-3
IURC Cause No. 39938

Petitioner's Exhibit ECB-6
IURC Casue No. 39938
Schedule 1

INDIANAPOLIS POWER AND LIGHT COMPANY
REGRESSION MODEL OF TRANSMISSION COST PER MWH

REGRESS : dependent variable is TRANS_COST_KWH

Using 1 - 1500

Variable	Coefficient	Std Err	T-stat	Signf
^CONST	5.54259	1.23646	4.48262	0.000
YEAR_83	0.377165	0.194377	1.94039	0.053
YEAR_84	0.784296	0.194894	4.02422	0.000
YEAR_85	0.809154	0.195278	4.14361	0.000
YEAR_86	0.916908	0.196306	4.67081	0.000
YEAR_87	0.696966	0.197724	3.52493	0.000
YEAR_88	0.644302	0.200094	3.22000	0.001
YEAR_89	0.831337	0.201755	4.12052	0.000
YEAR_90	0.757155	0.204549	3.70158	0.000
YEAR_91	0.936966	0.207541	4.51461	0.000
YEAR_92	0.992723	0.208990	4.75011	0.000
YEAR_93	1.19850	0.212637	5.63637	0.000
RES_PCT	3.91569	1.32973	2.94474	0.003
RES_USE	-0.197735	0.238622E-01	-8.28656	0.000
TRANS_LINES_KWH	2.69929	0.151071	17.8677	0.000
TRANS_UG_PCT	2.58449	0.470763	5.49001	0.000
SALES	-0.208243	0.453050E-01	-4.59648	0.000
COM_PCT	1.31710	1.19215	1.10481	0.269
IND_PCT	1.10369	1.08966	1.01287	0.311
ADJ_TRANS_AGE	-4.61181	0.662815	-6.95792	0.000
COST_OF_LIVING	0.100715E-02	0.133440E-02	0.754760	0.451

```
----------------------- Equation Summary ---------------------
No. of Observations =     1500        R2=  0.3251   (adj)=  0.3160
Sum of Sq. Resid. =    3485.92        Std. Error of Reg.=  1.53523
Log(likelihood)   =   -2760.86        Durbin-Watson     =  2.10466
Schwarz Criterion =   -2837.65        F ( 20, 1479)     =  35.6231
Akaike Criterion  =   -2781.86        Significance      = 0.000000
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Petitioner's Exhibit ECB-5
IURC Cause No. 39938

INDIANAPOLIS POWER AND LIGHT COMPANY
REGRESSION MODEL OF DISTRIBUTION COST PER MWH

REGRESS : dependent variable is DIST_COST_KWH

Using 1 - 1500

Variable	Coefficient	Std Err	T-stat	Signf
^CONST	-3.20825	1.18671	-2.70348	0.007
YEAR_83	0.477173	0.191787	2.48803	0.013
YEAR_84	1.04304	0.192800	5.40994	0.000
YEAR_85	1.21526	0.193662	6.27517	0.000
YEAR_86	1.46302	0.195087	7.49931	0.000
YEAR_87	1.34069	0.196014	6.83979	0.000
YEAR_88	1.34634	0.199084	6.76271	0.000
YEAR_89	1.65978	0.199735	8.30993	0.000
YEAR_90	1.87124	0.197413	9.47881	0.000
YEAR_91	2.10493	0.199413	10.5557	0.000
YEAR_92	2.48400	0.199827	12.4308	0.000
YEAR_93	2.99297	0.202812	14.7573	0.000
RES_PCT	23.9032	1.35205	17.6792	0.000
RES_USE	-0.491111	0.245915E-01	-19.9708	0.000
DIST_UG_PCT	1.91179	0.296091	6.45679	0.000
SALES	-0.674688E-01	0.429268E-01	-1.57172	0.116
DIST_LINES_KWH	1.08814	0.559752E-01	19.4396	0.000
POP_DENSITY	0.535864	0.372410E-01	14.3891	0.000
COM_PCT	8.14124	1.18540	6.86795	0.000
IND_PCT	6.45396	1.07827	5.98549	0.000
DIST_DEP_RATE	10.1400	5.65574	1.79287	0.073
ADJ_DIST_AGE	-9.06588	0.889692	-10.1899	0.000
COST_OF_LIVING	0.146205E-01	0.133287E-02	10.9692	0.000

------------------------ Equation Summary ---------------------

No. of Observations =	1500	R2= 0.7410 (adj)=	0.7371
Sum of Sq. Resid. =	3351.07	Std. Error of Reg.=	1.50626
Log(likelihood) =	-2731.27	Durbin-Watson =	2.01190
Schwarz Criterion =	-2815.37	F (22, 1477) =	192.033
Akaike Criterion =	-2754.27	Significance =	0.000000

Petitioner's Exhibit ECB-7
IURC Cause No. 39938

INDIANAPOLIS POWER AND LIGHT COMPANY
REGRESSION MODEL OF ADMINISTRATIVE AND OTHER COST PER MWH

REGRESS : dependent variable is ADMIN_COST_KWH

Using 1 - 1500

Variable	Coefficient	Std Err	T-stat	Signf
^CONST	15.6208	1.68490	9.27106	0.000
YEAR_83	0.430722	0.269071	1.60077	0.110
YEAR_84	0.812020	0.269207	3.01634	0.003
YEAR_85	1.24556	0.269344	4.62440	0.000
YEAR_86	1.76097	0.269690	6.52961	0.000
YEAR_87	1.99931	0.270137	7.40108	0.000
YEAR_88	2.36612	0.270762	8.73873	0.000
YEAR_89	2.49177	0.270963	9.19598	0.000
YEAR_90	3.21785	0.273309	11.7737	0.000
YEAR_91	3.74281	0.273344	13.6927	0.000
YEAR_92	3.90737	0.272183	14.3557	0.000
YEAR_93	4.77523	0.273390	17.4667	0.000
RES_PCT	4.39002	1.82733	2.40242	0.016
RES_USE	-0.503634	0.312625E-01	-16.1098	0.000
SALES	-0.356764	0.600411E-01	-5.94200	0.000
COM_PCT	-2.83196	1.66058	-1.70540	0.088
IND_PCT	-5.35277	1.50799	-3.54962	0.000
ADM_DEP_RATE	-0.628973	0.590469	-1.06521	0.287
ADJ_ADMIN_AGE	-0.729537	0.128763	-5.66575	0.000
COST_OF_LIVING	0.155788E-01	0.174417E-02	8.93195	0.000

------------------------ Equation Summary ----------------------

No. of Observations =	1500	R2= 0.5285 (adj)=	0.5225
Sum of Sq. Resid. =	6694.74	Std. Error of Reg.=	2.12685
Log(likelihood) =	-3250.30	Durbin-Watson =	2.15595
Schwarz Criterion =	-3323.43	F (19, 1480) =	87.3146
Akaike Criterion =	-3270.30	Significance =	0.000000

Petitioner's Exhibit ECB-6
IURC Casue No. 39938
Schedule 2

INDIANAPOLIS POWER AND LIGHT COMPANY
REGRESSION MODEL OF PRODUCTION COST PER MWH

REGRESS : dependent variable is PROD_COST_KWH

Using 1 - 1500

Variable	Coefficient	Std Err	T-stat	Signf
^CONST	27.8781	3.88627	7.17348	0.000
YEAR_83	1.68836	1.14602	1.47324	0.141
YEAR_84	3.62099	1.14613	3.15933	0.002
YEAR_85	4.10879	1.14632	3.58432	0.000
YEAR_86	3.44014	1.15537	2.97753	0.003
YEAR_87	3.81312	1.18190	3.22626	0.001
YEAR_88	3.52373	1.19280	2.95417	0.003
YEAR_89	4.27713	1.18824	3.59954	0.000
YEAR_90	6.26586	1.20960	5.18011	0.000
YEAR_91	5.82368	1.21162	4.80651	0.000
YEAR_92	5.62265	1.21745	4.61839	0.000
YEAR_93	5.80082	1.21656	4.76823	0.000
ADJ_PROD_AGE	-23.4271	2.01653	-11.6175	0.000
COST_OF_LIVING	0.103509	0.730408E-02	14.1714	0.000
HYD_PCT	-49.2273	3.58028	-13.7496	0.000
EXP_FOS	0.183137	0.343651E-01	5.32916	0.000
EXP_PUR	0.235498	0.326627E-01	7.20998	0.000
SALES	-1.88903	0.280466	-6.73530	0.000
PROD_DEP_RATE	13.7202	9.09438	1.50865	0.132
WIN_SUM_DIF	6.37160	1.66008	3.83813	0.000
POP_LARGE	1.52591	0.258104	5.91202	0.000

------------------------ Equation Summary ----------------------

No. of Observations =	1500	R2= 0.4916 (adj)=	0.4848
Sum of Sq. Resid. =	121118.	Std. Error of Reg.=	9.04941
Log(likelihood) =	-5421.88	Durbin-Watson =	1.96444
Schwarz Criterion =	-5498.67	F (20, 1479) =	71.5202
Akaike Criterion =	-5442.88	Significance =	0.000000

INDIANAPOLIS POWER AND LIGHT
TANGIBLE VALUE FROM PRODUCTIVITY OF BULK POWER

Line No.			Line No.
1	Historical Performance Value ($ Millions)	$109.21	1
2	Remining Life (Years)	27	2
3	Discount Rate	6.88%	3
4	Tangible Value ($ Millions)	$825.54	4
5	Tangible and On-Going Value ($ Millions)	$1,587.34	5
6	Tangible Value Percentage	52.01%	6

Line No.	Year	Percent Remaining	Nominal Amount	Present Value Factor	Present Value	Value as Percent of Historical Average	Cumulative PV	Line No.
7	1	96.30%	$105.16	0.935628	$98.39	90.10%	$98.39	7
8	2	92.59%	101.12	0.875401	88.52	81.06%	186.91	8
9	3	88.89%	97.07	0.819050	79.51	72.80%	266.42	9
10	4	85.19%	93.03	0.766327	71.29	65.28%	337.72	10
11	5	81.48%	88.99	0.716997	63.80	58.42%	401.52	11
12	6	77.78%	84.94	0.670843	56.98	52.18%	458.50	12
13	7	74.07%	80.90	0.627660	50.77	46.49%	509.27	13
14	8	70.37%	76.85	0.587257	45.13	41.33%	554.41	14
15	9	66.67%	72.81	0.549454	40.00	36.63%	594.41	15
16	10	62.96%	68.76	0.514085	35.35	32.37%	629.76	16
17	11	59.26%	64.72	0.480993	31.13	28.50%	660.89	17
18	12	55.56%	60.67	0.450031	27.30	25.00%	688.19	18
19	13	51.85%	56.63	0.421062	23.84	21.83%	712.03	19
20	14	48.15%	52.58	0.393957	20.72	18.97%	732.75	20
21	15	44.44%	48.54	0.368598	17.89	16.38%	750.64	21
22	16	40.74%	44.49	0.344871	15.34	14.05%	765.98	22
23	17	37.04%	40.45	0.322671	13.05	11.95%	779.04	23
24	18	33.33%	36.40	0.301900	10.99	10.06%	790.03	24
25	19	29.63%	32.36	0.282466	9.14	8.37%	799.17	25
26	20	25.93%	28.31	0.264284	7.48	6.85%	806.65	26
27	21	22.22%	24.27	0.247271	6.00	5.49%	812.65	27
28	22	18.52%	20.22	0.231354	4.68	4.28%	817.33	28
29	23	14.81%	16.18	0.216462	3.50	3.21%	820.83	29
30	24	11.11%	12.13	0.202528	2.46	2.25%	823.29	30
31	25	7.41%	8.09	0.189491	1.53	1.40%	824.82	31
32	26	3.70%	4.04	0.177293	0.72	0.66%	825.54	32
33	27	0.00%	0.00	0.165880	0.00	0.00%	825.54	33

Petitioner's Exhibit ECB-8
IURC Cause No. 39938
Schedule 2

INDIANAPOLIS POWER AND LIGHT
TANGIBLE VALUE FROM PRODUCTIVITY OF DISTRIBUTION

Line No.									Line No.
1	Historical Performance Value ($ Millions)	$16.09							1
2	Remining Life (Years)	20							2
3	Discount Rate	6.88%							3
4	Tangible Value ($ Millions)	$100.23							4
5	Tangible and On-Going Value ($ Millions)	$233.88							5
6	Tangible Value Percentage	42.85%							6
	Year		Percent Remaining	Nominal Amount	Present Value Factor	Present Value	Value as Percent of Historical Average	Cumulative PV	
7		1	95.00%	$15.29	0.935628	$14.30	88.88%	$14.30	7
8		2	90.00%	14.48	0.875401	12.68	78.79%	26.98	8
9		3	85.00%	13.68	0.819050	11.20	69.62%	38.18	9
10		4	80.00%	12.87	0.766327	9.86	61.31%	48.05	10
11		5	75.00%	12.07	0.716997	8.65	53.77%	56.70	11
12		6	70.00%	11.26	0.670843	7.56	46.96%	64.26	12
13		7	65.00%	10.46	0.627660	6.56	40.80%	70.82	13
14		8	60.00%	9.65	0.587257	5.67	35.24%	76.49	14
15		9	55.00%	8.85	0.549454	4.86	30.22%	81.35	15
16		10	50.00%	8.05	0.514085	4.14	25.70%	85.49	16
17		11	45.00%	7.24	0.480993	3.48	21.64%	88.97	17
18		12	40.00%	6.44	0.450031	2.90	18.00%	91.87	18
19		13	35.00%	5.63	0.421062	2.37	14.74%	94.24	19
20		14	30.00%	4.83	0.393957	1.90	11.82%	96.14	20
21		15	25.00%	4.02	0.368598	1.48	9.21%	97.62	21
22		16	20.00%	3.22	0.344871	1.11	6.90%	98.73	22
23		17	15.00%	2.41	0.322671	0.78	4.84%	99.51	23
24		18	10.00%	1.61	0.301900	0.49	3.02%	100.00	24
25		19	5.00%	0.80	0.282466	0.23	1.41%	100.23	25
26		20	0.00%	0.00	0.264284	0.00	0.00%	100.23	26

Petitioner's Exhibit ECB-8
IURC Cause No. 39938
Schedule 1

Petitioner's Exhibit ECB-9
IURC Cause No. 39938
Schedule 1

COST OF POWER FROM NON-UTILITY GENERATORS[1]

Description (1)	Number Of NUG Contracts (2)	1991 Average Cost/MWH (3)	1991 Weighted Average Cost/MWH (4)	Weighted Average Adjusted For Hidden Leverage (5)
NUGs With Available Data	1,318	$52.24	$56.39	$61.92
NUGs With Demand Payments	474	63.48	56.22	64.91
NUGs With Demand Payments Excluding California Projects	226	56.09	52.49	61.46
Indianapolis Power & Light 1993 Production Cost	N/A	29.62	29.62	29.62
Electric Utility Industry Average 1993 Production Cost	N/A	42.28	42.28	42.28

[1] Projects with rates above 10 cents per kWh are excluded.

INDIANAPOLIS POWER AND LIGHT
TANGIBLE VALUE FROM ADMINISTRATIVE AND OTHER

Line No.			Line No.
1	Historical Performance Value ($ Millions)	$13.93	1
2	Remining Life (Years)	14	2
3	Discount Rate	6.88%	3
4	Tangible Value ($ Millions)	$66.32	4
5	Tangible and On-Going Value ($ Millions)	$202.49	5
6	Tangible Value Percentage	32.75%	6

Line No.	Year	Percent Remaining	Nominal Amount	Present Value Factor	Present Value	Value as Percent of Historical Average	Cumulative PV	Line No.
7	1	92.86%	$12.94	0.935628	$12.10	86.88%	$12.10	7
8	2	85.71%	11.94	0.875401	10.45	75.03%	22.56	8
9	3	78.57%	10.95	0.819050	8.97	64.35%	31.52	9
10	4	71.43%	9.95	0.766327	7.63	54.74%	39.15	10
11	5	64.29%	8.96	0.716997	6.42	46.09%	45.57	11
12	6	57.14%	7.96	0.670843	5.34	38.33%	50.91	12
13	7	50.00%	6.97	0.627660	4.37	31.38%	55.28	13
14	8	42.86%	5.97	0.587257	3.51	25.17%	58.79	14
15	9	35.71%	4.98	0.549454	2.73	19.62%	61.52	15
16	10	28.57%	3.98	0.514085	2.05	14.69%	63.57	16
17	11	21.43%	2.99	0.480993	1.44	10.31%	65.00	17
18	12	14.29%	1.99	0.450031	0.90	6.43%	65.90	18
19	13	7.14%	1.00	0.421062	0.42	3.01%	66.32	19
20	14	0.00%	0.00	0.393957	0.00	0.00%	66.32	20

Petitioner's Exhibit ECB-8
IURC Cause No. 39938
Schedule 3